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THE TRANSACTIONS OF THE LINNEAN SOCIETY OF LONDON.

VOLUME XII.

LONDON:

PRINTED BY

RICHARD AND ARTHUR TAYLOR, SHOE-LANE:

SOLD AT THE SOCIETY'S HOUSE, NO. 9, GERRARD-STREET, SOHO;

AND BY LONGMAN, HURST, REES, ORME, AND BROWN,

PATERNOSTER-ROW.

MDCCCXVIII.

MISSOURI
BOTANICAL
GARDEN.

THE TRANSACTIONS OF THE LINNEAN SOCIETY OF LONDON.

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PART THE FIRST.

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TRANS-

TRANSACTIONS

OF THE

LINNEAN SOCIETY.

I. *Some Information respecting the Lignum Rhodium of Pococke's Travels, in a Letter to Alexander MacLeay, Esq. F.R.S. Sec. L.S. By Sir James Edward Smith, M.D. F.R.S. Pr. L.S., &c.*

Read February 21, 1815.

Dear Sir,

A point of botanical history has just been cleared up by my examinations of the manuscripts and dried specimens of the late Dr. J. Sibthorp, which, not being admissible into the *Flora Græca*, I think proper to rescue from oblivion, by requesting you to lay it before the Linnean Society.

Pococke, in his well-known "*Description of the East*," vol. ii. part 1. p. 230, speaking of Cyprus, has the following passage:

"Most of the trees in the island are evergreen; but it is most famous for the tree called by the natives *Xylon Effendi*, the Wood of our Lord, and by naturalists *Lignum Cyprinum* and *Lignum Rhodium*, because it grows in these two islands. It is called also the Rose Wood, by reason of its smell. Some say it is in other parts of the Levant, and also in the isle of Martinico. It grows like the *Platanus* or Plane-tree, and bears a seed or mast like that, only the leaf and fruit are rather smaller. The botanists

call it the Oriental Plane-tree. The leaves being rubbed have a fine balsamic smell, with an orange flavour. It produces an excellent white turpentine; especially when any incisions are made in the bark. I suppose it is from this that they extract a very fine perfumed oil, which, they say, as well as the wood, has the virtue of fortifying the heart and brain. The common people here cut off the bark and wood together, toast it in the fire, and suck it, which they esteem a specific remedy in a fever, and seem to think that it has a miraculous operation."

So far Dr. Pococke, who in the 2d part of the same vol. p. 188, mentions this tree again, and, in plate 89, gives a tolerable, but not precisely botanical figure of it. This plate is cited by Willdenow, *Sp. Pl. vol.* 4. 475, as a representation of the *Liquidambar imberbe*, *Ait. Hort. Kew, ed.* 1. *vol.* 3. 365. That author perceiving it to be no *Platanus*, but rather a *Liquidambar*, reasonably enough concluded it to represent the Oriental, rather than the American, species of that genus. The figure, though drawn and engraved by Ehret, is not sufficiently accurate to determine so nice a point. As it does not show the hairiness about the veins of the leaves, which distinguishes the occidental *Liquidambar* from the oriental, Willdenow is the more excusable; though the outline of the foliage agrees best with the former.

Dr. Sibthorp, in his visit to Cyprus, was anxious to ascertain the tree mentioned by Pococke, and the result of his inquiry cannot be better related than in the words of his manuscript journal.

" April 19, 1785, at eight in the morning we left Upreva, and, passing through the vales below, gradually ascended the mountains of Antiphoniti. At noon we arrived at the convent, most romantically situated among the mountains, with a view of the sea, and a distant sight of the mountains of Caramania. I was

come

come here, on the authority of Pococke, to see the *Lignum Rhodium.* This the Greeks call *Xylon Effendi.* The Eugumenos of the convent, a very old man, offered himself as my conductor; and leading me a few paces below the convent, into a garden, now covered with rubbish, he pointed out a tree, which upon examination I found to be *Liquidambar Styraciflua.* The trunk of it was much hacked. Different bits of it had been carried off by the curious or superstitious, as an ornament to their cabinets or churches. This was probably the same tree that Pococke had seen. To ascertain the *Lignum Rhodium* has been much wished by the naturalists. An American tree, growing in the swamps of Virginia, seems to have little claim to be considered as the tree which should produce it. The name of *Xylon Effendi*, and the traditions of the convent, testify the reputation in which this tree has long been held in the island. It was probably originally introduced by the Venetians during their possession of Cyprus. I could not discover, either from observation or inquiry, that it was to be found in any other part of the island; nor do I recollect that the *Liquidambar Styraciflua* has been mentioned, by any botanist, as an oriental tree. Whether the *Lignum Rhodium* of the shops is the wood of this tree or not, I am doubtful. The first *Aspalathus* of Dioscorides, I think, is certainly the *Lignum Rhodium* of the ancients."

Dr. Sibthorp then proceeds to mention two species of *Spartium*, one of which he suspects to be the *first*, and the other the *second*, *Aspalathus* of Dioscorides; but the want of descriptions, and of marked specimens, renders it impossible to distinguish what he meant. I do not presume to reconcile the discordant accounts, which may be found in writers on the Materia Medica, respecting the *Lignum Rhodium;* nor are these writers even agreed whether its name originated from the rose-like scent of the wood, or from

the isle of Rhodes being its native country. We find nothing among them indicative of the above *Liquidambar*, or any similar tree. It is evident that Pococke had but a superficial knowledge of the historical, and still less of the botanical, part of the subject. The only point I have had in view, after the example of Dr. Sibthorp, was to ascertain Pococke's plant. Specimens preserved in the herbarium of my deceased friend, and a pencil sketch by Mr. Bauer, show this to be, without any doubt, what he determined it, the *Liquidambar Styraciflua* of Linnæus, and not, as Willdenow presumed, the *imberbe* of Aiton. This last was brought from the Levant, Duhamel says from Caria, by Peysonel to the Paris garden, from whence I have an authentic specimen. Miller obtained seeds, by which the *L. imberbe* was introduced into our gardens, and he describes it well. Nothing can be more distinct as a species; but it was not well ascertained when Dr. Sibthorp began his travels, which will account for his adverting to the American *Liquidambar* only.

There still remains great difficulty in accounting for the introduction of this tree into Cyprus, and for its becoming so famous there. The plant is not known to have been cultivated in England, much before the end of the seventeenth century, scarcely fifty years before Pococke found it, apparently long established in Cyprus. The Venetians were owners of this island from the year 1480 to 1570; so that if they, as Dr. Sibthorp guesses, introduced this tree, it must have been among the earlier botanical importations from the new-discovered continent. But we can find no traces of the *Liquidambar* tree having, any where, excited the particular attention of the Venetians, or any other Italians, either for medical, œconomical, or religious purposes; nor does it occur in their gardens, or even their botanical catalogues, as far as I can trace. Pococke's vague mention of the "isle of Martinico"

nico" might induce a suspicion of its having been obtained from thence; but no Europæans were settled in that island previous to the year 1635, nor do we know that the tree, being a native of North America, would grow in so hot a climate.

How the *Liquidambar Styraciflua* travelled to Cyprus, must therefore remain unexplained; for we have not even a legend to help us, like that of the staff of Joseph of Arimathea at Glastonbury. That so great a novelty should have acquired considerable reputation in the garden of a Cyprian convent, so as to have even supernatural properties attributed to it, may not so much excite our wonder. Its celebrity indeed appears to have declined between the periods of Dr. Pococke's visit and Dr. Sibthorp's, but the tree itself still flourished. Dr. Sibthorp, like his predecessor, found it forming seed; yet it does not appear to have scattered its progeny over the neighbourhood, as, in so fine a climate, it might have been expected to have done, though I have never heard of its bringing any seed to perfection in England, where it rarely even blossoms.

I remain, &c.

Norwich, Feb. 20, 1815. J. E. Smith.

II. *Of*

II. *Of the Formation of the Vegetable Epidermis. By the Rev. Patrick Keith, F.L.S.*

Read March 7, 1815.

The pellicle that constitutes the vegetable epidermis has generally been regarded as a membrane essentially distinct from the parts which it invests, and as generated with a view to the discharge of some peculiar functions in the vegetable œconomy. Some phytologists, however, have viewed it in a light altogether different, and have regarded it as being merely the effect of accident, and nothing more than a scurf formed upon the exterior and pulpy surface of the parenchyma indurated by the action of the air. This was the opinion of Grew and Malpighi, and, though it does not seem to have ever met with any very general reception, has been revived of late by M. Mirbel, who, professing to be dissatisfied with the analogy that has generally been thought to exist between the epidermis of the animal and vegetable, contends that the latter is nothing more than the indurated surface of the parenchyma, from which it differs only in such circumstances as are occasioned by position. If it is more or less transparent; if it is tougher and firmer in its texture than the parenchyma, or any of its parts; it is only because it is constantly exposed to the influence of light and air, and to the contact of such bodies as float in the atmosphere; but it is not to be regarded as constituting a distinct organ or membrane; or as

exhibiting

exhibiting any proof of its being analogous to the epidermis of animals*.

Such is the substance of M. Mirbel's opinion, against which he is aware that objections may still be urged. For it may be said, If this is the true origin of the epidermis, how comes it to separate so easily from the interior parts in the spring? To this objection M. Mirbel furnishes the following reply, namely, that its facility of detachment is owing to the disorganization occasioned in it by means of its exposed situation, which has even the effect of ultimately separating it from the plant altogether, as may be seen in the instances in which it bursts and exfoliates when it is not able to expand in proportion to the internal parts. And thus M. Mirbel presumes he has got rid of all difficulties.

But the above is by no means the most formidable objection to which the hypothesis is liable. For if it be true that the epidermis is nothing more than the pellicle formed on the external surface of the parenchyma indurated by the action of the air, then it will follow that an epidermis can never be completely formed till such time as it has been exposed to that action. But it is known that the epidermis exists in a state of complete perfection, in cases where it could not possibly have been affected by the action of the external air. If you take a rose-bud or bud of any other flower before it expands, and strip it of its external covering, you will find that the petals and other inclosed parts of the fructification are as completely furnished with their epidermis as any other parts of the plant, and yet they have never been exposed to the action of the air. The same may be said of the epidermis of the seed while yet in the seed-vessel, or of the root, or of the stem of the paper birch, which still continues to form and to detach itself, though the interior layers are defended from the action of the air by the layers that invest them.

* Traité d'Anat. et de Phys. Veg. i. 87.

In

In herbs, and in the temporary parts of woody plants, such as the leaves and flowers, the epidermis never detaches itself at all; which circumstance M. Mirbel adduces as an additional argument in favour of his hypothesis. But to me it seems an argument against it. For, if the air produces such violent effects upon the trunk and branches of woody plants, why does it not produce similar effects upon other plants, or upon other parts of the same plant? And why is the epidermis of the leaf, flower and fruit incapable of being again regenerated, if accidentally destroyed? Till a satisfactory answer can be given to these inquiries, that shall be at the same time compatible with the supposed action of the air in other cases, it is impossible to admit the hypothesis of M. Mirbel.

But so far is the action of the external air from being the cause and origin of the epidermis, that it is even detrimental to its formation. For the re-production of a part that has been accidentally destroyed, in cases capable of re-production, is always more easily effected if the wound be covered closely up*. And hence it is extremely improbable that the epidermis is merely a modification of the external surface of the parenchyma effected by the influence and action of the air; if rather it is not evidently an organ formed by the agency of the vital principle, even when the plant is yet in embryo, for the very purpose of protecting it from injury when it shall have been exposed to the action of the air in the process of vegetation.

Accordingly the developement of the epidermis is found to keep pace with that of the plant which it invests, so that it "grows with its growth and strengthens with its strength," expanding in all its dimensions, and accommodating itself with wonderful facility to the augmentation of the inclosed parts, as may be seen in the case of trees and fruits of rapid growth. Its

* Senebier, Phys. Veg. i. 154.

expansion

expansion is circumscribed, however, by certain bounds or limits which it cannot pass. For, when it has become indurated with age, or when vegetation is too luxuriant, it refuses or is unable to expand further, and consequently bursts. But if it does not burst spontaneously, where it does not expand freely, it is then thought to check or retard the growth of the plant, by operating as a sort of tight roller or bandage; as may be exemplified in the case of the cherry-tree, the epidermis of which the gardener is often obliged to lay open by means of a longitudinal incision, in order to facilitate the growth of the parts inclosed.

With regard to the disavowed analogy between the animal and vegetable epidermis, it is of no consequence to the above argument whether it holds good or not. But there are several important respects in which an analogy between the two cuticles is sufficiently striking. They are both capable of great expansion in the growth of the subject. They are both easily regenerated when destroyed, (with the exceptions above stated,) and seemingly in the same manner. They are both subject, in certain cases, to a constant decay and repair; and they both protect from injury the parts inclosed. Whence we feel ourselves entitled to draw a conclusion directly the reverse of that of M. Mirbel, namely, that the epidermis of the vegetable is not an accidental scurf formed on the surface of the parenchyma by means of the action of the air; but a distinct and individual organ formed by the agency of the vital principle, at the period of the generation of the plant, and destined to the discharge of peculiar functions in the vegetable œconomy, as well as exhibiting a close analogy to the epidermis of the animal.

Stow Maries, Dec. 22, 1814.

III. *On the Classification of the Natural Tribe of Insects* NOTONECTIDES, *with Descriptions of the British Species. By William Elford Leach, M.D. F.R.S. and L.S.*

Read April 4, 1815.

BEFORE laying down the characters of this interesting and natural tribe of insects, it may not be deemed improper to give a very short account of what has been done by preceding entomologists.

Linné and all his predecessors comprehended the species under the generic appellation *Notonecta*. The accurate Geoffroy was the first who separated *Notonecta* into two genera, which have been adopted by most succeeding writers, excepting Linné, who in the last edition of his *Systema Naturæ* has merely given the synonyms of that author, without taking the least notice of the important characters which induced him to separate them.

De Geer confounded the animals of this tribe with *Nepa* and *Naucoris*, whilst Latreille and Olivier placed them in a division of their family *Hydrocorisæ*.

In the *Edinburgh Encyclopedia* I separated them from the *Hydrocorisæ*, and placed them in a particular tribe, named in that work *Notonectides*, which term I shall adopt in the following little essay.

Ordo. HEMIPTERA*.

Subordo. HYDROCORISÆ. Insecta aquatica, antennis minutissimis.

Tribus 2. NOTONECTIDES.

Pedes duo postici longiores, natatorii.

Fam. I.

Corpus cylindrico-ovatum, aut ovato-quadratum. *Tarsi* omnes biarticulati. (*Scutellum magnum.*)

Gen. 1. NOTONECTA.

Corpus cylindrico-ovatum. *Antennæ* articulo tertio secundo tenuiore. *Tarsi* antici articulo primo longiore. *Ungues* postici minutissimi.

Gen. 2. PLEA.

Corpus ovato-quadratum. *Antennæ* articulo tertio aliis majore. *Tarsi* antici articulis subæquè longis. *Ungues* postici magni.

Fam. II.

Corpus depresso-cylindricum. *Tarsi* antici uniarticulati; quatuor postici biarticulati. (Elytra margine antico ad basin saltem canaliculato.)

Gen. 3. SIGARA.

Scutellum distinctum. *Thorax* transversus, linearis. *Corpus* ovatum, posticè acuminatum.

Gen. 4. CORIXA.

Scutellum nullum. *Thorax* transversus, posticè productus. *Corpus* lineare, anticè et posticè rotundatum.

* In the *Edinburgh Encyclopedia* I have divided the HEMIPTERA of Latreille into HEMIPTERA and OMOPTERA, which Latreille considered as two great divisions of one order.

Fam. I.

All the insects of this family swim on their back, moving by means of their long hinder legs, which resemble oars; whence they have been aptly named *boat-flies.*

Gen. 1. NOTONECTA.

Besides the characters given in the above table, the following will be useful in order to enable the young entomologist to distinguish this genus from PLEA, from which it has not been separated by any entomologist*.

The thorax is hexagonal, the anterior part is much attenuated, and the hinder margin is straight. The head is narrower than the broadest part of the thorax; the eyes are oblong, and converge a little behind; the hinder legs are much ciliated, and the claws are so minute as to be discovered with great difficulty; the tips of the elytra are notched.

Spec. 1. *Notonecta furcata.*

N. elytris nigris, maculis duabus baseos griseis: posticâ majore.

Notonecta furcata. *Fabr. Ent. Syst.* iv. 58.

—— *Syst. Rhyng.* 102. 2.

Oliv. Encycl. Méthod. Hist. Nat. viii. 388. 2.

Var. β. Elytris maculâ ferrugineâ.

Habitat in Caledoniæ, Angliæ aquis vulgatissime.

OBS. Elytra apice fuliginosa; dorsum nigrum.

Spec. 2. *Notonecta maculata.*

N. elytris fusco ferrugineoque variis, dorso ferrugineo fasciâ mediâ pernigrâ.

Notonecta maculata. *Fabr. Ent. Syst.* iv. 58.

—— *Syst. Rhyng.* 103. 4.

* In the *Genera Crustaceorum et Insectorum,* tom. iii. p. 150, the accurate Latreille has detailed the principal characters of PLEA, which he considered as a species of *Notonecta.*

Notonecta

Notonecta maculata. *Oliv. Encycl. Méthod. Hist. Nat.* viii. 388. 4.
Notonecta glauca var. A. *Latr. Gen. Crust. et Ins.* iii. 150.
Habitat in Angliâ prope Bristol, Plymouth, et Exeter.
Elytra apice fuliginosa.

Spec. 3. *Notonecta glauca.*

N. elytris griseis margine fusco-punctatis, dorso nigro apice pallido.
Notonecta glauca *auctorum*.
Var. β. Elytris subferrugineis fusco-subirroratis.
Var. γ. Elytris apice subnebulosis.
Var. δ. Elytris pallidis immaculatis.
Habitat in Britanniâ vulgatissime.

This species is by far the most common that occurs in Great Britain. The back of the abdomen is always black, terminated with pale yellow. Var. β at first sight bears a near resemblance to *N. maculata;* but the spots in the front of the elytra, and the colour of the back, will readily distinguish them. Var. γ I twice received from Mr. S. W. Millard, who took them near Bristol. Var. δ I found in the north of England, and I suspect it to be an immature specimen. All the varieties, excepting the last, have a small blackish spot on the hinder margin of the elytra; but it is much more distinct in some specimens than in others, and it is never to be seen in *N. maculata:* this affords another character for discrimination, and therefore ought not to remain unnoticed.

Gen. 2. PLEA.

The thorax is obscurely hexagonal, with the hinder margin prominent and rounded; the head as broad as the broadest part of the thorax; the eyes are rather oblong, without the least tendency to converge behind; the hinder pair of legs not more ciliated than the others, but are terminated by very strong and distinct claws; tips of the elytra acuminated and entire.

Spec.

Spec. 1. *Plea minutissima.*

P. grisea, fronte lineâ fuscâ, thorace elytrisque subtilissime punctatis.

Notonecta cinerea, anelytra. *Geoffroy Ins. Par.* i. 477. 2.
Notonecta minutissima. *Fourc. Entom. Paris.* i. 220. 2.
Latr. Gen. Crust. et Ins. iii. 150.
Oliv. Encycl. Méth d. viii. 389.
Fabr. Ent. Syst. iv. 59.
—— *Syst. Rhyng.* 104. 10.

Long. Corp. 1½ lin.

Habitat in aquis stagnantibus prope Londinum vulgatissime.

This species has been considered by Geoffroy, Fabricius, and Olivier, as *Notonecta minutissima* of Linné, which reference undoubtedly belongs to the following species; viz. to *Sigara minutissima*.

Whether *Notonecta minutissima* of Panzer (*Fn. Ins. Germ. In.* ii. 14.) be intended for this species, I cannot take upon myself to decide, as his figure indicates a deep notch in the hinder margin of the thorax, which I have not been enabled to detect in any specimens; his figure must therefore be incorrect, or be intended for a distinct species from the one in question.

Geoffroy has described the larva, never having seen the perfect insect.

Fam. II.

Gen. 3. SIGARA.

The characters already given sufficiently distinguish this from the two preceding genera.

Spec. 1. *Sigara minutissima.*

S. supra cinerea, elytris fusco obsolete maculatis, subtus pedibusque flavis.

Notonecta

Notonecta minutissima. *Linn. Fn. Sv.* 244. 905.
—— *Syst. Nat.* i. 713. 3.

Habitat in rivis, lacubus vulgatissime.

Long. Corp. 1 lin.

Linné has described this species so minutely as to leave no doubt with respect to the above reference; in the twelfth edition of his *Systema Naturæ*, and in the last edition of his *Fauna Suecica*, he has given the following characters: "*N. elytris cinereis; maculis fuscis longitudinalibus. Magnitudo minimæ arenulæ; depressa est. Pedes posteriores longiores; primum par minimum. Habet alas, elytra, scutellum.*"

Sigara minutissima is found in every part of Great Britain; I have observed it in the Lake of Killarney, and in other lakes in the south of Ireland; in the north of England, near Carlisle, and in Derwentwater; in Loch Lomond and Loch Katerine in Scotland; in the river Tavy in Devon; and I have frequently received it from the Norfolk collectors: whence we may infer that it occurs in that country.

To this genus probably belongs the *Sigara coleoptrata* of Panzer, *Faun. Ins. Germ. In.* 50. 24.

Gen. 4. CORIXA.

The thorax is more or less produced behind in all the species of this genus; but it is not evident in the first division of the genus until the elytra have been elevated. The front, the under parts of the body, and the legs, in all the British species, are yellowish.

* *Elytris ad apicem subgradatim acuminatis.*

The channel on the anterior margin of the elytra in this division is uninterrupted, and gradually disappears before it reaches to the extremity of the elytra.

Spec.

Spec. 1. *Corixa coleoptrata.*

C. thorace rufo-griseo, elytris sublutescentibus: maculis longitudinalibus nigricantibus.

Sigara coleoptrata, elytris totis coriaceis fuscis; margine exteriori flavo. *Fabr. Syst. Rhyng.* 105. 4.

Habitat in Norfolciæ aquis prope Norwich.

Although the character by Fabricius does not accord with that given above, yet as he drew his description from a museum specimen (which generally assumes the colour he mentions) I give his synonym without any hesitation; but this insect is distinct from the *Sigara coleoptrata* of Panzer, which is figured with a scutellum, and most probably belongs to the genus *Sigara* as mentioned above.

** *Elytris ad apicem subrotundatis.*

The channel in the fore part of the elytra, at about two-thirds from its commencement, is interrupted by an oblique transverse elevated line, and it terminates abruptly before it reaches to the apex of the elytron, and then it leaves the margin, inclining a little inwards or backwards.

a. *Elytris thoraceque rugulosis.*

Spec. 2. *Corixa striata.*

C. thorace elytrisque fuscis: lineolis flavicantibus transversis striatis, dorso nigro, lateribus flavidis.

Notonecta striata. *Linn. Fn. Sv.* 244. 904. *Syst. Nat.* i. 712. 2.

Habitat in aquis stagnantibus.

Descr. Elytra striis undulatis flavicantibus, margine exteriore fusco. Thorax perfuscus lineolis transversis numerosissimis flavicantibus.

Spec. 3. *Corixa stagnalis.*

C. fusca, thorace lineolis transversis numerosissimis flavicantibus, elytris fuscis flavido irroratis.

Habitat

Habitat in aquis stagnantibus putridis vulgatissime.

Elytra fusca flavido-irrorata; margine anteriore flavido; margine postico basin versus flavido-lineato. Dorsum fusco-nigricans.

This species is about half the size of *C. striata.*

Spec. 4. *Corixa fossarum.*

C. fusca, thorace lineolis sex transversis flavidis, elytris fuscis flavido-irroratis.

Habitat in fossis passim.

C. stagnali paulo minor. Elytra fusca flavido-irrorata, antice flavida, postice basin versus flavido-lineata. Dorsum flavum.

Spec. 5. *Corixa lateralis.*

C. albida, thorace lineolis septem nigris, elytris nigro-irroratis: margine antico immaculato.

Habitat in fluviis.

C. fossarum paululum minor. Dorsum atrum, lateribus flavis.

Spec. 6. *Corixa dorsalis.*

C. flavida, thorace margine lineolisque sex transversis nigris, elytris nigro-irroratis: margine antico immaculato.

Habitat in fluviis vulgatissime.

C. stagnali paulo major. Dorsum flavum.

b. *Elytris thoraceque glaberrimis, lævibus.*

Spec. 7. *Corixa Geoffroyi.*

C. flavida, thorace lineolis transversis numerosissimis nigris, elytris nigro-irroratis: dorso pernigro apice flavido.

La Corise. *Geoff. Hist. Nat. des Insect.* i. *p.* 478. *pl.* 9. *fig.* 7.

Sigara striata. *Panz. Fn. Ins. Germ. In.* 50. 23.

Long. Corp. $\frac{1}{2}$ unc.

Habitat in aquis stagnantibus vulgatissime.

All authors have considered this species as *Notonecta striata* of Linné, although it will not agree with his character. It is figured by Geoffroy and Panzer, and is of the former author the species serving as the type of the genus *Corixa*.

Spec. 8. *Corixa affinis.*

C. flavida, thorace lineolis transversis numerosissimis nigris, elytris nigro-irroratis: dorso pernigro; lateribus postice dentato-flavis.

Habitat in stagnis prope Plymouth haud infrequens.

C. Geoffroyi duplo minor.

IV. *Some*

IV. *Some Remarks on the Natural History of the Black Stork, for the first time captured in Great Britain. By George Montagu, Esq. F.L.S.*

Read May 2, 1815.

ARDEA NIGRA. *Linn.*

Black Stork.

Most ornithological writers mention this bird as an European species, less common than the White Stork, and of a more solitary disposition. Its latitudinal range in its periodical migrations is apparently greater than that of the white species, since it is said to visit Russia and Siberia, and also to pass over Sweden in the spring in vast flocks, flying towards the extreme north, and soaring to so great a height as to appear no larger than a sparrow.

From innumerable observations it is evident that migrative birds are much more confined in their longitudinal range than in their latitudinal: hence it is that many species pass through France and Germany in the spring, and return in the autumn, which by no chance have as yet been ever observed to wander into this country, although they proceed much further north than any part of Britain. Others, from accidental causes of which we have no certain knowledge, occasionally vary a little from their natural course, and are found solitary in this country. Of this I have the pleasure of announcing an example in *Ardea nigra*, the only instance I believe of its being found at large in Great Britain.

This bird was captured by means of a slight shot-wound in the wing, without breaking a bone, and is now in my possession in excellent health. To my scientific friend, Mr. Austin of Bridgewater, naturalists in general, and myself in particular, are indebted for this addition to the British Fauna, he having rescued it from plebeian hands, where in all probability the circumstance would have been consigned to oblivion. It was shot in West Sedgemoor, adjoining the parish of Stoke St. Gregory, Somersetshire, on the 13th of May 1814; and what is remarkable, another very rare bird, the White Spoonbill, was shot on the same moor, by the same person, in November of the preceding year.

When first the Black Stork was observed, it was searching for food by the side of a drain, and when approached flew a considerable distance; but in a second attempt the fowler got sufficiently near to slightly wound it. It made little resistance, and on the following day ate some eels that had been placed near it.

I was greatly rejoiced to receive this interesting bird alive from Mr. Austin, as its manners do not seem to be much known. Like the White Stork, it frequently rests upon one leg; and if alarmed, particularly by the approach of a dog, it makes a considerable noise by reiterated snapping of the bill, similar to that species. It soon became docile, and would follow its feeder for a favourite morsel, an eel. When very hungry it crouches, resting the whole length of the legs upon the ground, and supplicantly seems to demand food, by nodding the head, flapping its unwieldy pinions, and forcibly blowing the air from the lungs with audible exspirations. Whenever it is approached, the expulsion of air accompanied by repeated nodding of the head is provoked. The bird is of a mild and peaceful disposition, very unlike many of its congeners; for it never makes use of its formidable bill offensively against any of the companions of its prison, and even submits

peaceably

peaceably to be taken up without much struggle. From the manner in which it is observed to search the grass with its bill, there can be no doubt that reptiles form part of its natural food; even mice, worms, and the larger insects, probably add to its usual repast. When searching in thick grass or in the mud for its prey, the bill is kept partly open: by this means I have observed it take eels in a pond with great dexterity: no spear, common in use for taking that fish, can more effectually receive it between its prongs than the grasp of the Stork's open mandibles. A small eel has no chance of escaping when once roused from its lurking-place. But the Stork does not gorge its prey instantly like the Corvorant; on the contrary, it retires to the margin of the pool, and there disables its prey by shaking and beating with its bill, before it ventures to swallow it. I never observed this bird attempt to swim; but it will wade up to the belly, and occasionally thrust the whole head and neck under water after its prey. It prefers an elevated spot on which to repose: an old ivy-bound weeping-willow, that lies prostrate over the pond, is usually resorted to for that purpose. In this quiescent state the neck is much shortened by resting the hinder part of the head on the back; and the bill rests on the fore-part of the neck, over which the feathers flow partly so as to conceal it, making a very singular appearance.

The Black Stork, perhaps, is not more delicate in its food than the white species: fish appears to be preferred to flesh, but when very hungry any sort of offal is acceptable.

All birds that pursue their migrative course by night in congregation, have undoubtedly some cry by which the whole assembly is kept together; yet it should appear that at other times the Black Stork is extremely mute: not a single note has been heard to issue from the bird in question since its captivity.

As

As there is a little variation in the plumage of my specimen of *Ardea nigra* from what has generally been described, and as the plumage when first captured indicated immaturity, being very different from what has been since assumed, I beg leave to subjoin a short description of three states of plumage.

The head and upper part of the neck speckled with pale brown of different shades, having a slight tinge of rufous, becoming darker on the lower part of the neck, the feathers being dusky in the middle: the back, scapulars, and coverts of the wings dusky-black, slightly margined with brown: quills and tail dusky-black, the latter glossed with green: the feathers on the lower part of the neck before pretty long and loose, hanging over the breast: from thence to the tail dingy-white. On the back were two or three feathers, apparently new, that were of a dark glossy green, indicating a change of plumage. This description was taken in June 1814, soon after the bird was captured. The bird continued very gradually to moult throughout the summer and winter, becoming much darker on the head and neck, and much greener on the back; and by the beginning of February 1815 the upper part of the head and back of the neck became dusky-black, glossed with green; the lower neck before dusky-black, and the whole upper part of the body, including wing-coverts and scapulars, dark shining green, similar in colour to that variety of the Glossy Ibis known under the title of *Tantalus viridis**. The under parts of the plumage continued as at first. The bill, which is full seven inches in length, has the upper mandible a trifle the longest, and deflects a little at the point: the colour is dusky-red, brighter at the base, and orange at the tip†: irides light hazel: the lore and orbits bare of feathers, and of a dull red: the legs

* Pennant says blue. Arct. Zool.

† Latham says greenish-grey, with a whitish tip.

and

and toes dull orange. These parts have changed but little, and perhaps are rather brighter in colour than at first.

Indisposition having prevented my seeing the bird since the last-mentioned period till the middle of March, I was much surprised to find the appearance of a few feathers on the upper part of the back, that were dusky, resplendent with violet and purple, having a margin of dark glossy green. These elegant feathers continued to increase in number, till the whole upper part of the back had nearly assumed this beautiful plumage by the first of April. At this time no other part of the bird indicated any further change of plumage: the scapulars and coverts, many of which had recently changed, continued of the same colour as last described, without the purple reflections or marginal green. It is scarcely possible to account for such a succession of change in plumage in so short a time, except by supposing that a change in the constitution of the bird, produced by captivity and a want of natural food, had caused obstruction to the usual course of moulting, and that the autumnal change had been retarded, and was scarcely effected before the spring moulting commenced. The bill at this season has also become more orange.

V. *Some*

V. *Some Account of the Tantalus Ephouskyca, a rare American Bird. By Benjamin Smith Barton, M.D. F.M.L.S.*

Read June 6, 1815.

The annexed figure (Tab. I.) of a rare American bird, together with those very few facts and circumstances which I have been able to collect concerning the bird, may, I flatter myself, prove acceptable to the Linnean Society. It may be proper to observe, that although the drawing, by my friend Mr. William Bartram, has been in my possession for many years, no engraving has ever been made from it.

We know little or nothing of this bird, but what has been communicated to us by the ingenious gentleman just mentioned. I here subjoin all that he has said concerning it.

" There is inhabiting the low shores and swamps of this river*, and the lakes of Florida, as well as Georgia, a very curious bird, called by an Indian name, (Ephouskyca †,) which signifies in our language the Crying Bird. I cannot determine what genus of European birds to join it with. It is about the size of a large domestic hen. All the body, above and beneath, is of a dark lead colour, every feather edged or tipped with white, which makes the bird appear speckled on a near view: the eye is large, and placed high on the head, which is very prominent: the bill or beak is

* The St. Juan, in East Florida.

† " *Tantalus pictus.*" In another part of his work (p. 293.) Mr. Bartram mentions our bird by the same name.

five

Linn. Trans. Vol. XII. Tab. I. p. 24.

Weddell Sc.

Tantalus Ephouskyca.

five or six inches in length, arched or bent gradually downwards, in that respect to be compared to one half of a bent bow: it is large or thick near the base, compressed on each side, and flatted at top and beneath, which makes it appear four-square for more than an inch, where the nostrils are placed, from whence to their tips both mandibles are round, gradually lessening or tapering to their extremities, which are thicker for about half an inch than immediately above, by which the mandibles never fit quite close their whole length: the upper mandible is a small matter longer than the under: the bill is of a dusky green colour, more bright and yellowish about the base and angles of the mouth. The tail is very short, and the middle feather the longest: the others on each side shorten gradually, and are of the colour of the rest of the bird, only somewhat darker: the two shortest or outermost feathers are perfectly white, which the bird has a faculty of flirting out on either side as quick as a flash of lightning, especially when he hears or sees any thing that disturbs him, uttering at the same instant an extreme harsh and loud shriek. His neck is long and slender; and his legs are also long, and bare of feathers above the knee, like those of the bittern, and are black, or of a dark lead colour*."

It will be evident, I think, from an inspection of the drawing, that the Ephouskyca is a species of the genus Tantalus or Ibis; a genus of which America produces many species, several of which are now known to be natives of the United States. I cannot, however, find that the "Crying Bird" is noticed by any of the European ornithologists. I am pretty sure that it is not one of the nineteen species described by Mr. Latham in his *General Synopsis of Birds*. I may add, that our bird has entirely escaped

* Travels through North and South Carolina, Georgia, East and West Florida, &c., by William Bartram, pp. 147, 148. Philadelphia, 1791.

the notice of the late Mr. Wilson, author of the *American Ornithology*. This gentleman has noticed only three species of the genus Tantalus, viz. *Tantalus Loculator*, or Wood Ibis; *T. ruber*, or scarlet Ibis; and *T. albus*, or white Ibis. I think it highly probable that the two last birds are really one and the *same* species.

I am fully sensible how imperfect are these notices: but I have not hitherto been able to obtain any thing more satisfactory on the subject, though I have for several years endeavoured, through the medium of my correspondents in the country of the Muscogulge, or Creek-Indians, to obtain a specimen of the bird. I have no doubt that I shall ultimately be successful in my researches. In this case, I shall not fail to communicate something much more satisfactory on the subject to the Linnæan Society, whose pursuits are at all times highly interesting to me.

I shall only further observe at present, that should the Crying Bird prove to be a new species of Tantalus (I mean a species not noticed by any *systematic* ornithologist), it may be well to call it *Tantalus Ephouskyca*. This, I have already observed, is its Indian name, the literal meaning of which has been mentioned. *Ephous*, or *Ephaus*, in the language of the Creek Indians, signifies a bird.—Nor will those who are well versed in the study of the oriental languages, fail to observe how close is the affinity between this word and the word for bird in the language of the ancient Chaldeans: I may add, even in the Hebrew. That this affinity is not *accidental*, will appear more probable from what I am now to state; that the Creek and other North-American languages contain *many* words that are most palpably derived from the Chaldaic, Hebrew, Persian, &c.*

There is no reason to believe that the *Tantalus Ephouskyca* has

* See my New Views, &c. Philadelphia, 1798.

ever

ever been seen in the United States, to the north of Georgia, or at least of the Carolinas. In page 293, Mr. Bartram mentions it as one of those birds which are natives of Carolina and Florida, and continue the year round in those countries. I have no doubt that we shall find our Tantalus in Cayenne, and other parts of southern America. I have elsewhere shown that the American animals have a great geographical range.

B. S. Barton.

Philadelphia, July 10, 1814.

VI. *Observations on the Orchis militaris of Linnæus.* *By Mr. J. E. Bicheno, F.L.S.*

Read June 20, 1815.

The very near affinity which orchideous plants have to each other has rendered their separation into genera and species a matter of great difficulty. Scarcely any tribe, however, has been more effectually changed, or received greater improvements since the time of Linnæus, than this; and in support of the fact, we need only refer to the labours of Swartz in Sweden, and of Brown in our own country. No species required an elucidation more than the *Orchis militaris*; for Linnæus has introduced so many varieties, and they are so badly supported by synonyms, that it is difficult, sometimes impossible, to make out what he means. It is to be feared that English botanists in general have not understood them, and that they have still further perplexed the subject. My object, therefore, on the present occasion is to point out what I conceive to be the English species, which have been called, since the time of Linnæus, by the name of *Orchis militaris*. Of these there are three: the *Orchis fusca* of Curtis; the *Orchis militaris* of *English Botany*, *vol.* xxvii. *t.* 1873; and the *Orchis tephrosanthos* of Willdenow and Swartz. The synonyms which I am enabled to ascertain are not numerous, because I am situated far from the rich libraries of the metropolis; but even if I could command them, I believe I should not be disposed to quote largely, since it is almost impossible to identify these plants in the old authors, unless

less the description is accompanied with a figure. It will facilitate our inquiries if we examine each of these species separately, beginning with

Orchis fusca.

There is less difficulty in identifying this species and tracing its synonyms than in either of the other two. Linnæus, misled by the uncharacteristic and formal figure of Dillenius in *Ray's Synopsis*, *t.* xix. *f.* 2. has made two varieties of it, β and δ; and Hudson is the first author, adopting the Linnean system, who made it distinct under the name of *purpurea*. He, however, united it again with *militaris* in the second edition of his *Flora*. Jacquin clearly defined the plant; and his opinion was followed by Murray, Hoffman, Roth, Willdenow, Swartz, and most of the continental botanists. Curtis also has well distinguished it in his *Flora Londinensis*. Withering, in the second edition of his *Arrangement*, has made it a variety, but says he had not seen it. Sir James Smith in his excellent *Flora Britannica* has done the same, but has followed Linnæus too closely; and, if his synonyms be correct, has included three English species, and we believe a foreign one, in his *militaris*: *O. tephrosanthos*, *O. militaris*, *Eng. Bot. vol.* xxvii. *t.* 1873, *O. variegata* (the fig. 22, 23, and 24, of Vaillant being this plant), and *O. fusca*. The error in the first volume of *English Botany*, where *fusca* is called *militaris*, is corrected in a later volume, to which we have referred; and another plant is admitted, though unwillingly, as the α intended by Linnæus.

The earliest notice we have of this as an English plant is to be found in Gerard, p. 166; where he informs us that it grows in many places in Kent with the *Bee* and the *Fly Satyrions*, and among the rest "upon the hills adjoining to a village named Greenhithe," the very place referred to by James Sherard in Dillenius's Ray, and where it is frequently found at present. This

information

information Gerard communicated of the *Ornithophora candida*, 165, or Butterfly Orchis; but the figure is *Orchis fusca*: and there is little doubt but that this was intended, since Johnson corrects the synonym in his edition, and complains greatly of the transposition of the figures in the chapter in which this plant stands. Caspar Bauhine, too, refers to this *icon*, excluding the synonym, under his *Cynosorchis militaris major*, which is unquestionably our present plant. Johnson's *Orchis Strateumatica*, *p.* 215, is an improved figure, and is copied in Parkinson's *Theatrum Botanicum*, *p.* 1344. *no.* 6. The description of the flower is significant enough, being like the "body of a man with his hands and legs cut off." Dillenius is the next author who takes notice of it as an English plant (for Ray does not seem to have been acquainted with its being indigenous); and though his figure in the *Synopsis* is stiff and bad, his description is appropriate—"Galea obtusa atro-rubens minusque surrecta, qua nota a præcedente (*O. tephrosanthos*) distinguitur." Vaillant, who understood the *Orchideæ* better than any of his predecessors, has given an excellent drawing of the flowers of this and others nearly allied to it; but it is curious that he should attribute to its flowers an insupportable smell of the goat, while Curtis says they have a strong smell, somewhat like, but not so pleasant as, *Anthoxanthum*. Blackstone is the last English author of the old school, who seems to have been acquainted with it, having found it plentifully "in the old chalk-pit near the paper-mill at Harefield." Since his time it has been gathered frequently in the fine chalky districts of Kent and Middlesex; but we do not know that it is found beyond these counties. Haller in his *Hist. t.* 31, and Curtis *Flor. Lond. fasc.* 6. *t.* 64. have given superb figures of it.

This *Orchis* surpasses all its English congeners in size and grandeur, and may be known by the lip of the nectary being divided into three segments, the two lateral ones being linear, and the middle

middle one broad, bilobed, generally with an intermediate tooth. The middle segment varies in the depth of its fissures, so that many authors have described the lip as four-cleft, and others as five-cleft; but, when this is the case, the segments are never so regularly linear as in the following species, and they are notched; and, besides, the petals are broader and not nearly so acuminate.

ORCHIS MILITARIS. *Eng. Bot. t.* 1873.

Though this plant is figured by the old herbalists Gerard, Johnson, and Parkinson, it does not appear to have been noticed as a distinct species by any English writer, until it was taken up by Sir J. E. Smith in the 27th volume of *English Botany*. In this work, however, it is confounded with another, the *O. tephrosanthos* of Swartz. The figure which Johnson gives of it, p. 216, *no.* 13. is a tolerable similitude, and leaves little doubt as to what he intended. Parkinson has copied it, p. 1344, *no.* 8. and has added another of a most fanciful and ridiculous kind, *p.* 1347, which seems to have had its origin in this species or the following. Merett in his *Pinax* tells us that Mr. Brown, one of the authors of the *Catalogus Oxoniensis*, and whom he calls in his preface "vir exercitatissimus et eruditissimus," found three *Orchides* "near the highway from Wallingford to Reading, on Barkshire side the river.

"1. Orchis anthropophora autumnalis. *Col.* mas. *C. B.* et *P.* 1347 *. *The Man Orchis.*

"2. Orchis anthropophora oreades altera. *Col. p.* 318.

"3. Orchis oreades trunco pallido, brachiis et cruribus saturate rubescentibus."

The *O. militaris*, *E. B. t.* 1873 and *O. tephrosanthos* are probably intended by these descriptions, since the former is found at

* This reference to Bauhine I do not understand thoroughly, but suppose it to refer to his *Orchis flore nudi hominis effigiem representans, mas.—Pin.* p. 82.

the

the present day in the neighbourhood of Streatley and Pangbourn, answering exactly to the situation which Brown describes; and the latter is said to grow there, and at Caversham in the neighbourhood, on the authority of the same Mr. Brown, in Ray's *Catalogus Plantarum*.

Vaillant has given the figure of a flower, *t.* 31. *f.* 21. which he regards as only a variety of *fusca*, and says he gathered it on the same spot with *O. tephrosanthos*; but we are inclined to believe it belongs to this species. Ray's *Orchis anthropophora altera*, *Hist. Plant.* 1218, seems to answer to it. From the reports we have received of the Harefield *O. militaris*, mentioned by Blackstone as growing with the *fusca*, we suspect it to belong to this species rather than to the following. Haller's *t.* 28. is somewhat doubtful.

Willdenow's specific character, and consequently that of the *Hortus Kewensis*, does not accord with the English plant; for the middle segment cannot be called bilobed, nor are the bracteas, upon which the editor of Linnæus places his chief dependence, obsolete. The reference to Vaillant also leads me to suspect it, *t.* xxxi. *f.* 24., as well as *f.* 22. and 23., being *O. variegata*. The bracteas, however, vary so much in shape in the dried specimens of all the three plants, from the circumstance of the point being caducous, that we ought not, perhaps, to rely too much on the character drawn from this appendage. Should Willdenow's species be found to be distinct, it will be necessary to give our plant a new trivial name; but we leave this to be ascertained by those who have foreign specimens at hand, and who can refer to the figures which he has quoted.

The chief character of our plant is the regular linear incurved segments of the lip, which are broader than in *tephrosanthos*, and not notched and ragged as in *fusca*, but much narrower. The flowers grow in a dense spike, which old Gerard describes as ash-coloured.

Orchis tephrosanthos.

This plant is well figured in the first and second editions of Gerard, *p.* 156, *no.* 1. *p.* 205, *no.* 2. though under a different name in each, and copied from them into Parkinson, *p.* 1344, *no.* 4. These old authors, however, do not mention it as found in England. The earliest information we have of this fact, if we except the allusion to it by Merett, already stated, is recorded in Ray's *Catalogus Plantarum*, where we learn that it was discovered by Mr. Brown on "the hills by the river Thames, near Cawsham-Bridge, a mile from Reading, and on several other hills on the other side the water towards Wallingford." This last *habitat* is omitted in the first edition of the *Synopsis*. Ray tells us in his Journey on the Continent, that he found it near Geneva, and that he had recently observed it in England; and yet it might be suspected that he never gathered it himself at Caversham (the modern name) in Oxfordshire, since he records the place in Gibson's Camden as being in Berkshire. It is found at present on the rising ground among the bushes to the west of the great chalk-pit facing the river Thames; but it is an uncertain plant, like many other *Orchideæ*, being found some years very abundantly, and then altogether as sparingly. The two *habitats* quoted in *Flora Britannica*, from Ray and Sibthorp, for this plant, are the same spot. That this is the *tephrosanthos* of Willdenow there can be no doubt. It takes its trivial name from the ash-coloured spike; but this would have been equally applicable to Bauhin's plant, *Orchis galea et alis cinereis*, *Hist.* ii. *p.* 755, which seems not to belong to it, though quoted by Ray, but to *O. militaris* of *Eng. Bot.* or of Willdenow.

It might have been supposed that Withering, in his second edition of the *Arrangement*, intended our present species by his α, since he has uniformly quoted synonyms and figures which refer

to it; but the description is evidently drawn up from a foreign species, probably *O. variegata*, and the references are all transferred in the succeeding edition to another variety. This is ε of Linnæus.

This plant is easily known by the narrow segments of the lip, and the acuminated petals. It is a delicate, smaller plant than the other two, flowers early in May, and has a remarkably abrupt termination in the spike of flowers. The lip of the nectary is less scabrous than in either of the others. Vaillant, *t.* 31. *f.* 25. 26. has well represented the flower; but we believe that no modern figure has yet been published of this rare plant.

VII. Glyphis

VII. Glyphis *and* Chiodecton, *two new Genera of the Family of Lichenes, with Descriptions and Figures of the Species hitherto discovered. By Erik Acharius, M.D. F.M.L.S.*

Read November 21, 1815.

Postquam fundamenta Lichenologiæ jam pridem jeci* vel vera, ut opinor, principia constitui, spem mihi facio, fore neminem rei hujus intelligentem, qui negaverit, duo hæc describenda genera, satis superque a reliquis omnibus distincta esse.

In dies increscere cœpit Lichenum tam numerus antea incognitarum specierum, quam de earum proprietatibus et partium formis singularibus notitia. Quæ harum detectarum divitiis superstructa est, scientia, specierum in plura genera distributionem necessariam reddidit; quando nempe characteribus essentialibus apprime convenientibus, fixis certisque, hæc determinari possunt.

Inter eas species, quarum apothecia intra singularem et e propria substantia, nec a thallo formatam verrucam locata sunt†, distinctissimum inter reliqua a me stabilita, huc usque solum eminuit genus, quod *Trypethelium* vocatur‡. Species illæ nuper detectæ, quarum descriptiones et figuras Societati Linneanæ Lon-

* *Lichenographia Universalis*, Göttingæ 1810 edita c. Tab. color. collatis Præmonendis in *Synopsi* mea *Methodica Lichenum*, jam nunc typis exscripta et mox evulganda.

† Lichenes *Idiothalami Hyperogenei*. Cfr. Conspectus Systemat. Lichenum in Synopsi supra memorata.

‡ Monographiam hujus Generis c. Figuris dedi in Actis Societ. Phytogr. Gorenkensis, vol. i. seqq.—Cfr. etiam de hoc Genere Synopsis Meth. Lichenum antea citata.

 dinensi

dinensi jam offerre animum induxi, cum Trypetheliis natura et dispositione jam dictarum verrucarum et apotheciorum etiam conveniunt, sed propriis simul dignoscuntur characteribus essentialibus, quibus a Trypetheliis omnibus et singulis ita discedunt, ut inter hæc, salvo eorum charactere generico, recipi nequeant. Hæ notæ e sequentibus clarius apparebunt.

GLYPHIS.

CHARACTER GENERIS ESSENTIALIS.

RECEPTACULUM *universale* crustaceo-cartilagineum plano-expansum adnatum uniforme. *Partiale* verrucæforme, e propria substantia colorata formatum. APOTHECIA subcartilaginea subrotunda oblongiuscula elongataque supra denudata impressa vel canaliculata (atra), in singula verruca plura innata, intus homogenea.

CHARACTER NATURALIS.

RECEPTACULUM UNIVERSALE. *Thallus* cartilagineo-membranaceus, contiguus uniformis plano-adnatus, effusus l. limitatus.

RECEPTACULUM PARTIALE. *Verruca* planiuscula, colore et substantia propria a thallo diversa, apothecia fovens. *Apothecia* numerosa verrucæ propriæ innata, ad ejus superficiem denudata, aggregata l. subconfluentia, difformia (subrotunda, oblonga, elongato-linearia) supra impressa, disco planiusculo, excavato l. subcanaliculato, in ambitu magis elevata submarginata, solidiuscula atra, parenchymate homogeneo.

OBS. Singulare hoc genus, equidem tam ab *Opegraphis* et *Gyrophoris*, quam a *Trypetheliis* distinctissimum, cum his tamen

generibus

generibus analogiam majorem habet quam cum reliquis e familia Idiothalamorum Lichenibus; sed singulæ ejus, quotquot sunt adhuc notæ, vel a me nunc primum detectæ species, notas quasdam proprias et essentiales offerunt, quibus ab omnibus aliis valde recedunt. E characteribus supra datis hæ etiam facile eruuntur. In primis vero in eo differt genus *Glyphis*, quod, si verrucas apotheciorum, ut ita dicam, vel apothecium commune respicimus, hoc nec propria nec crustæ solidiori quadam membranula tectum sit, sed e substantia plus minus pulveracea et raro solidiuscula formatum, atque aliter quam thallus coloratum; quodque ipsa apothecia partialia, intra verrucas jam dictas pro maxima sua parte ad superficiem verrucarum denudata sint, atque loco thalamiorum globosorum perithecio et nucleo instructorum (ut in *Trypetheliis*) tota quanta e parenchymate homogeneo atro compactiori, in aqua macerato versus centrum tantisper dilutius colorato, formata; figura aliquando rotundata, sæpissime oblonga, elongata ac linearia, disco depresso vel canaliculato, unde eorum ambitus elevatus, illum quasi marginatum reddit. Itaque differt *Glyphis*

ab *Opegrapha*, *Graphide* et *Gyrophora* apotheciis partialibus intra propriam substantiam verrucæformem (s. apothecium quoddam commune) aggregatis et receptis, nec non horum forma et interna structura diversa.

a *Trypethelio*: apotheciis partialibus oblongis et linearibus, perithecio, ostiolo papillato, nucleoque destitutis.

a *Chiodecto*: forma et textura apotheciorum partialium, atque eorum situ, præsentia disci et marginis.

Derivatur nomen generis a Græca voce γλυφις ob apothecium commune opusculum cælatum assimilans.

Locus: inter *Lichenes Idiothalamos* in ordine *Hyperogeneorum*, post *Trypethelium*.

Species.

Species.

1. GLYPHIS *labyrinthica.* Tab. II. fig. 1.

G. crusta fuscescenti-subolivacea; apotheciorum verrucis oblongis sordide albis plano-convexiusculis pulverulentis, e disco apotheciorum elongatorum canaliculato nigro rimoso-subreticulatis.

Glyphis labyrinthica. *Ach. Synops. p.* 107.

Trypethelium labyrinthiforme. *Ach. Sylloge nov. Lichenum ad Cl. Schrader pro ejus Diario Botan. missa.*

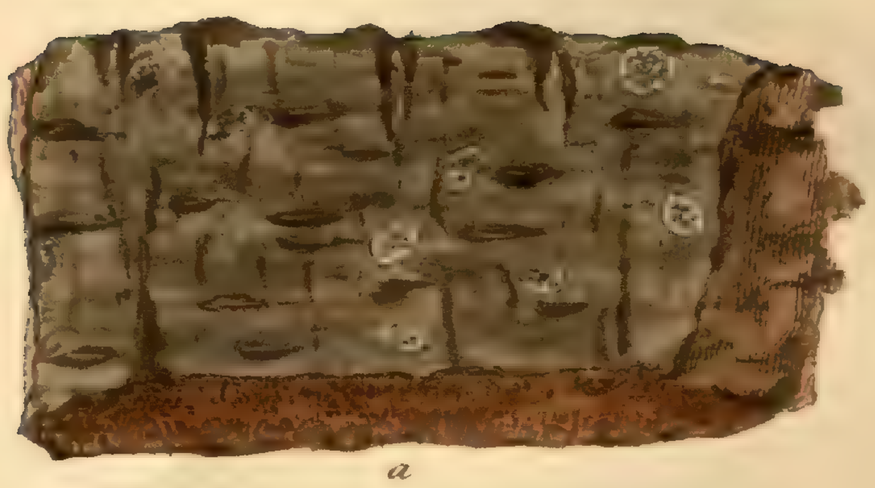
Habitat in Guinea ad Sierram Leonam supra corticem arboris ignotæ, quam secum adtulit Clariss. D. D. et Prof. AD. AFZELIUS, incolis sub nomine Duffa obvenientis.

DESCR. *Crusta* membranacea tenuis lævigata, sed ex eminentiis subjacentis corticis inæquabilis, e fusco et cinereo olivacea, late, ut videtur, et indeterminatim expansa. *Verrucæ* apotheciorum rarius sparsæ, parum supra crustam elevatæ subpulvinatæ, supra planiusculæ, rotundatæ, oblongæ, curvatæ, difformes, in ambitu integerrimæ tenuissimæ, sordide albicantes et pulvere concolori suffusæ, rugis et rimis nigris frequentissimis tenuissimis profundis ramosis anastomosantibus et reticulatis secundum formam apotheciorum inclusorum notatæ. *Apothecia* longiuscula et elongata linearia, intra substantiam albicantem verrucarum abscondita, vario modo flexuosa ibidemque confluentia, atra opaca, extus intusque e pulvere compacto solidiuscula, supra et ad superficiem verrucarum disco angustissimo profunde excavato canaliculata et inde marginibus elevatis parallelis acutiusculis, pruina albida verrucarum velatis, secundum longitudinem cincta, rimas verrucarum nigras decussantes formantia.

OBS. Pauca tantum rarissimæ hujus speciei individua, nec nisi in unico corticis frustulo majori occurrentia inveni, licet quam-

Linn. Trans. Vol. XII. Tab. 2. p. 38.

Fig. 1.



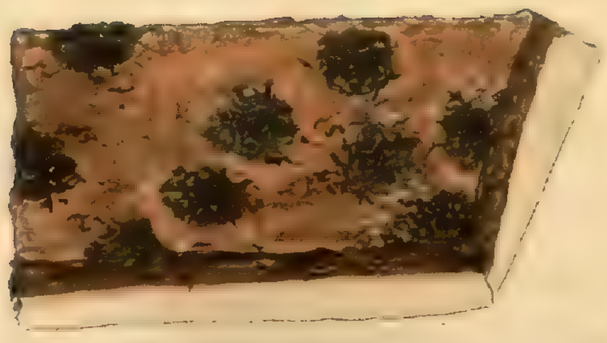
a

b

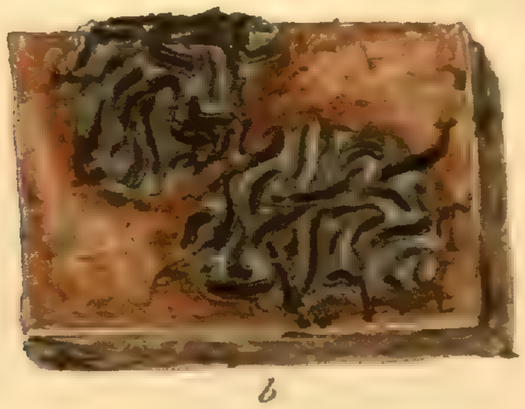
c

d

Fig. 2.



a



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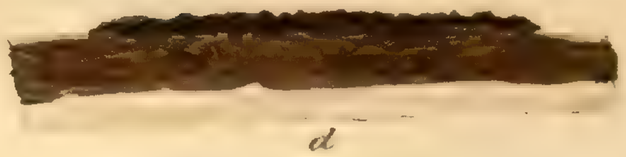
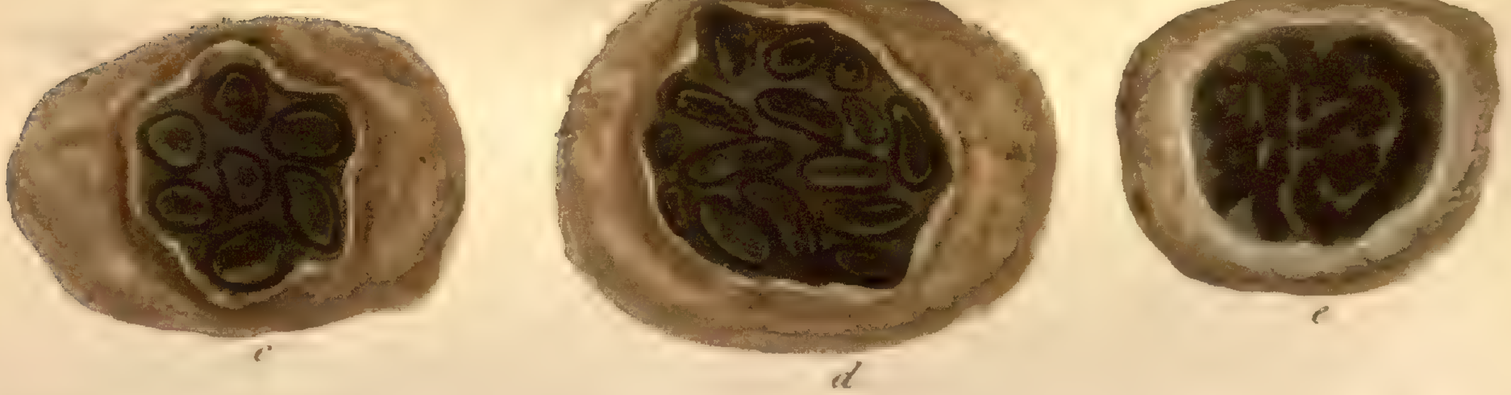


d

Fig. 3

b



c d e

f

E. Acharius. del!

J. Curtis. sculp!

quamplurimas alias cortices in eodem loco a se collectas scrutinio meo benevole concesserit amicissimus Afzelius.

Explicatio Icon. Tab. II. fig. 1.—a. Corticis frustulum hujus Lichenis crusta obductum, in quo verrucæ apotheciorum sparsæ, magnit. nat.—b. Duæ verrucæ supra visæ multum auctæ.—c. Particula thalli in quo verruca et ejus apothecia inclusa horizontaliter resecta repræsentantur, ut structura et color internarum harum partium videatur, magn. valde aucta.—d. Particula corticis cum crusta et verruca apotheciorum ad perpendiculum dissecta.

2. Glyphis *tricosa*. Tab. II. fig. 2.

G. crusta ferrugineo-lutescente; apotheciorum verrucis planis difformibus cinerascentibus, e disco apotheciorum elongatorum rimoso-canaliculato rugoso-gyrosis.

Glyphis tricosa. *Ach. Synops. p.* 107.

Graphis tricosa. *Ach. Lichenogr. Univ. in Add. p.* 674.

Habitat in India (Occid.?) ad corticem arboris ignotæ. Swartz.

Descr. *Crusta* in specimine a me viso effusa contigua cartilagineo-membranacea læviuscula lutescenti-brunnea s. pallide-ferruginea. *Verrucæ* apotheciorum parum supra crustam elevatæ planæ irregulares, intus extusque cinerascentes, maculas quasi difformes dispersas et approximatas formantes; ob copiam apotheciorum nigrorum e cinereo et nigro variegatæ ac gyrosæ. *Apothecia* verrucis immersa figura variant subrotunda oblonga et longiuscula, plurima autem valde elongata linearia flexuosa, conferтissima, intus extusque solidiuscula atra opaca, disco concaviusculo l. rimoso-canaliculato et marginibus parum elevatis tenuioribus integris l. tenuissime crispis ac flexuosis, ad superficiem verrucarum prominulis nudis instructa, unde hæ supra rugoso-gyrosæ apparent. Extra ipsas verrucas non raro extenduntur quædam ex apotheciis longioribus et crustam percurrunt, formam et ambitum verrucarum perquam irregularem reddentia. Intra

verrucas

verrucas apothecia confertissima aggregata et singulari modo invicem complicata, congeriem vermiculorum curvatorum atrorum assimilantia, nec tamen inde in hac specie concreta vel confluentia ut in *Glyphide labyrinthica.*

Obs. Fugitivis oculis inspecta similitudinem quamdam habet hæcce species cum *Trypethelio anomalo*, inque ejusdem arboris cortice obveniente, sed attentius examinata facile ab hoc dignoscitur. Præsentia verrucarum propriarum et natura apotheciorum quantum ab *Opegraphis*, *Graphidibus* et *Gyrophoris* discedat nostra species unicuique patet.

Explic. Icon. Tab. II. fig. 2. a. Crusta et verrucæ quædam hujus speciei in corticis frustulo, magn. naturali.—b. Particula crustæ resecta cum apotheciorum verrucis binis supra adspectis, magn. aucta.—c. Verruca alia in particula crustæ una cum apotheciis inclusis horizontaliter dissecta, ut harum conformatio intra eam conspici queat.—d. Sectio perpendicularis verrucæ cum apotheciis, crustæ et corticis. Figg. c. et d. magnopere auctæ.

3. Glyphis *cicatricosa.* Tab. II. fig. 3.

G. crusta fuscescenti-cinerea nigro-limitata; apotheciorum verrucis cinerascenti-nigris in ambitu subcrenatis cinereoque marginatis planis, e disco apotheciorum latiori subrotundo elongatoque concaviusculo cicatricosis.

Glyphis cicatricosa. *Ach. Synops. p.* 107.

Trypethelium cicatricosum. *Ach. in supra dicta Sylloge.*

Habitat in Guinea ad corticem *Codarii Solandri* Vahl. (*Dialii guineensis* Willd. *Sp. Pl.*) aliarumque arborum ibidem crescentium.

Descr. *Crusta* tenuis membranacea lævigata e fusco cinerascens, in statu perfecto lineola nigra serpentina limitata. *Verrucæ* apotheciorum sparsæ parvæ, parum a crusta elevatæ planæ intus

intus extusque nigricantes vel obscure cinereæ solidiusculæ, in ambitu plerumque lobato-crenatæ et e pruina cinerea ibidem sordide albicantes, per ætatem vero evanescente. *Apothecia* ipsa fere tota intra parenchyma verrucarum abscondita, solo disco ad earum superficiem perceptibili, minus numerosa quam in reliquis speciebus, latiora et breviora quam in duabus præcedentibus, jam subrotunda, jam oblonga et vix unquam triplo longiora quam lata, atque sub hac forma parum curvata, disco aliquantum depresso l. concaviusculo, margine obtuso tantillum elevato integerrimo cincto; quam ob caussam verrucæ supra quasi cicatricibus nigris inustis notatæ videntur. Eleganter et in modum rosulæ in quamplurimis verrucis dispositi observantur apotheciorum disci, uno scilicet centrali et cæteris circumcirca hunc coronantibus.

Obs. Quoad habitum prope accedit ad *Glyphidem favulosam*, sed criteriis essentialibus ab ea prorsus diversa species manet: ut *Trypethelii* speciem in supra memorata *Sylloge*, cum Cl. Schrader communicata, inter alias etiam hanc dubitanter recensui.

Explic. Icon. Tab. II. fig. 3.—a. Pars rami *Codarii* cum crusta et apotheciis hujus speciei, magnit. naturali. (In eodem ramo ad * delineata etiam occurrit *Graphis tenella*, nova species in *Synopsi Lichen.* p. 81, descripta.)—b. Lichenis crusta et apothecia in suis verrucis supra visa, magn. aucta.—c. et d. Verrucæ apotheciorum seorsim cum particula crustæ cui adnascuntur desumtæ, supra visæ et magnopere auctæ, quarum una apothecia offert ad verrucæ superficiem subrotundata et oblonga concaviuscula atque inde marginata in formam rosulæ disposita; altera vero (d.) apothecia longiora et curvata absque ordine aggregata. —e. Sectio horizontalis ejusmodi verrucæ, apotheciorum formam et dispositionem intra substantiam verrucæ exhibens.—f. Verrucæ et apotheciorum inclusorum sectio perpendicularis, magn. insigniter aucta.

4. GLYPHIS *favulosa*. Tab. III. fig. 1.

G. crusta albicante nigro-limitata; apotheciorum verrucis rotundatis planiusculis nigris glauco-pruinosis margine cinerascentibus, e disco apotheciorum suborbiculari excavato cicatricosis.

Glyphis favulosa. *Ach. Synops. p.* 107.

Trypethelium favulosum *a me pridem appellatum, tam in Actis Gorenkens. vol.* i. *quam in Sylloge Lichen. Novor. supra memorata.*

Habitat in America ad corticem *Crotonis Cascarillæ.*

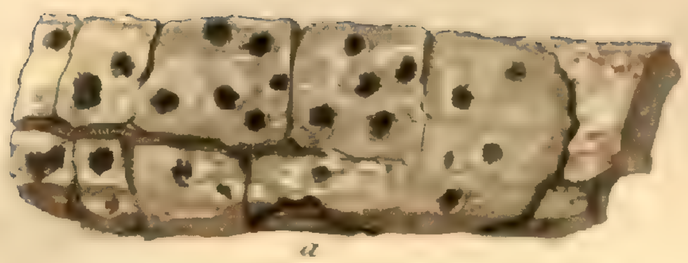
DESCR. *Crusta* cartilaginea, crassior quam in antecedentibus speciebus, contigua lævigata, ex eminentiis et fissuris corticis subjacentis parum inæquabilis ac diffracta, sordide albescens, subinde pulvere albo adspersa, per ætatem e pallido-cinerascens vel parum fuscescens, in ambitu irregularis, lineola nigra repanda et serpentina in statu perfecto limitata. *Verrucæ* apotheciorum supra crustam prominentes, subrotundæ oblongæ difformes, juniores convexæ pulvere albo-cinerascente l. glaucescente adspersæ, vetustiores planæ latiores, margine elevato subintegro utplurimum cinereo-pulverulento cinctæ, substantia interna carbonacea. *Apothecia* verrucis innata subrotunda aut aliquando oblongiuscula, ad superficiem verrucarum quamplurima aggregata, supra excavata, in ambitu elevata, unde distincte marginata apparent, foveolasque nigras seu cicatrices in superficie verrucarum efformant.

OBS. Descriptio in *Actis Gorenkens.* ob specimina minus bona, utpote vitiosa, secundum jam datam corrigi debet. Iconem novam etiam nunc dedi, quum forte incendio Moscoviæ deleta est, quæ ibidem incideretur.—Affinitas multa hujus speciei est cum *Glyphide cicatricosa*, a qua tamen abunde differt crustæ natura ac colore, verrucis multo majoribus magis elevatis, nec non apotheciis in his numerosioribus.

Explic.

Linn. Trans. Vol. XII. Tab. 3. p. 42.

Fig. 1.



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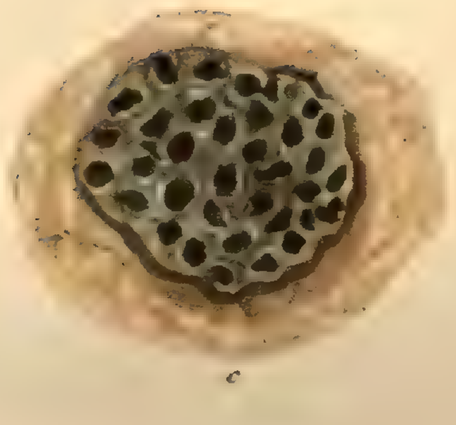

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e

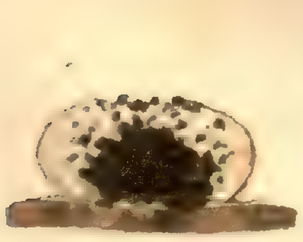
Fig. 2.

a

b

c

d



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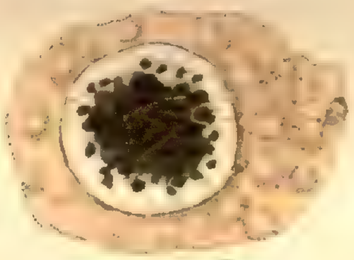

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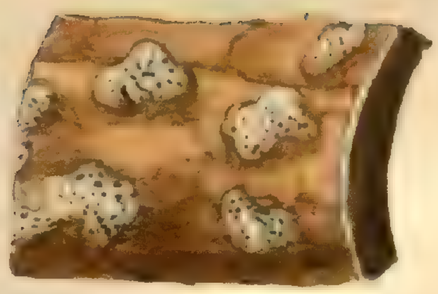
Fig 3

a



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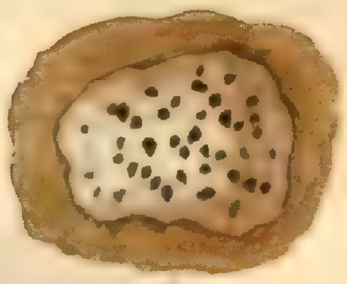

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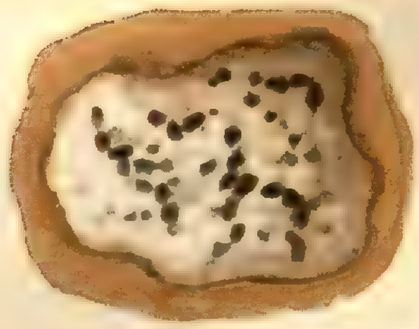
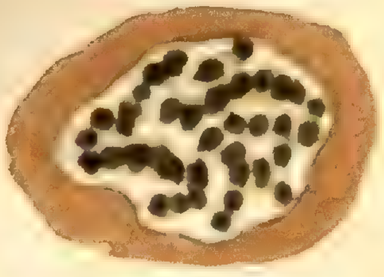


d.



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E. Acharius del.t

J. Curtis sculp.t

Explic. Icon. Tab. III. fig. 1.—a. Lichen in cortice *Cascarillæ*, magn. naturali.—b. Crustæ frustum cum verrucis quibusdam, magn. aucta.—c. Verruca solitaria, supra visa, insigniter aucta.—d. Sectio horizontalis verrucæ, substantiam ejus et apotheciorum inclusorum internam ostendens, magn. valde aucta.—e. Verruca cum parte subjacente corticis ad perpendiculum dissecta sub augmento adhuc majori.

CHIODECTON.

Character Generis Essentialis.

Receptaculum *universale* crustaceo-cartilagineum plano-expansum adnatum uniforme. *Partiale* verrucæforme e propria substantia colorata (alba) formatum. Apothecia subpulveracea subglobosa (atra), plura singulis verrucis inclusa subconfluentia, alia ad earum superficiem instar punctorum elevatorum notabilia.

Character Naturalis.

Receptaculum universale. *Thallus* cartilagineo-membranaceus, contiguus uniformis plano-adnatus, effusus l. limitatus.

Receptaculum partiale. *Verruca* convexa l. sphærica, colore (albo) et substantia propria a thallo diversa, apothecia includens. *Apothecia* numerosa subglobosa, plurima intra substantiam verrucæ propriæ nidulantia aggregata et confluentia, alia pauciora ad ejus superficiem in modum papillarum punctiformium subprominentia, intus extusque subpulveracea atra.

OBS. Verrucas apotheciorum hujus generis si spectemus, natura sua a *Trypetheliorum* et *Glyphidum* parum recedunt; sed si formam et indolem apotheciorum inclusorum consideremus, hæc in *Chiodecti* speciebus diversissima sunt et notas characteristicas validissimas essentiales offerunt, quibus hocce genus ab his et aliis satis distinctum sese præbet. Quoad verrucas ipsas, in notis speciebus, coloris sunt extus intusque albissimi et substantia earum bombycino-pulveracea. Intra hanc apothecia nidulantur minuta subglobosa vel parum difformia suboblonga, homogenea subpulverace atra, nullum nuclei seu parenchymatis solidioris texturam offerentia, tamen maceratione in aqua ad earum centrum substantia aliquantum pellucidior in *Chiodecto seriali* observata est; de cætero in hac specie quasi concatenata, in altera ad centrum verrucæ adeo congesta ut massam pulveraceam simul sumta constituant. Versus superficiem verrucarum quædam etiam locata observantur apothecia, has supra quasi nigro-punctatas reddentia atque admodum spectabiles. Differt adeo *Chiodecton*

a *Trypethelio*, *Porina*, *Thelotremate* et *Variolaria*, absentia thalamii veri, nam neque perithecii et ostioli, neque nuclei vestigia in ejus apotheciis observantur,—in specie a tribus ultimis generibus: Verruca apotheciorum e propria nec e thalli substantia formata.

a *Glyphide*: situ, forma, et natura apotheciorum, nec disco nec margine instructorum atque omnino intra substantiam verrucarum nidulantium—a reliquis cognatis Lichenum Generibus, ut supra monui, præsentia apothecii communis seu verrucæ, a thallo haud formatæ, *Chiodectis*, *Glyphidibus* et *Trypetheliis* solis solemnis, nec non forma et indole apotheciorum partialium.

A Græca voce δεκτον receptaculum et χιος albus nomen generis composui.

Locus:

Locus: inter *Lichenes Idiothalamos* in ordine *Hyperogeneorum* post *Glyphidem.*

Species.

1. Chiodecton *sphærale.* Tab. III. fig. 2.

C. crusta effusa lacteo-pallescente tenuissime tuberculosa; apotheciorum verrucis subglobosis albissimis, apotheciis intus ad centrum earum in massam confluentibus.

Chiodecton sphærale. *Ach. Synops. p.* 108.

Trypethelium pulcherrimum. *Ach. in supra dicta Sylloge.*

Habitat in America ad corticem *Cinchonæ flavæ* dictæ.

Descr. *Crusta* cartilagineo-membranacea effusa (uti videtur) lactea seu pallescens, e verruculis confertis albidioribus (forte initia apotheciorum communium) inæquabilis. *Verrucæ* apotheciorum frequenter subglobosæ l. parum compressæ albissimæ lævigatæ, punctis plurimis atris, (a totidem apotheciis, in superficie verrucarum subprominulis, ortis) supra notatæ. *Apothecia* numerosissima minuta subglobosa intus extusque homogenea subpulverulenta atra opaca, intra verrucas nidulantia, et juxta superficiem earum sparsa, et, quoad maximam partem, versus centrum congregata ibidem confluentia et massam atram simul sumta efformantia.

Explic. Icon. Tab. III. fig. 2.—a. Hujus Lichenis crusta cum apotheciis in corticis frustulo, magn. naturali.—b. Particula Lichenis, magn. aucta.—c. Verruca fertilis separata a latere visa, multum aucta.—d. Alia supra adspecta, cincta particula crustæ verrucosæ, sub eodem augmento.—e. Verruca ad perpendiculum et.—f. Alia horizontaliter resecta, structuram et dispositionem apotheciorum intra has ipsas verrucas repræsentantes, magn. valde auctæ.

2. Chiodecton *seriale.* Tab. III. fig. 3.

C. crusta flavo-fuscescente lævigata nigro-limitata; apothe-

ciorum

ciorum verrucis oblongo-difformibus convexiusculis, apotheciis intus per series subconcatenatis.

Chiodecton seriale. *Ach. Synops. p.* 108.

Trypethelium paradoxum. *Ach. in Act. Soc. Phytogr. Gorenk. vol.* i. *c. figg. inque Sylloge Novor. Lich.*

Habitat in America supra corticem *Bonplandiæ trifoliatæ* WILLD. (vulgo *Angusturæ* dictam.)

DESCR. *Crusta* cartilagineo-membranacea læviuscula, e subjacentis corticis irregularitate parum inæquabilis seu eminentiis levibus notata et diffracto-rimosa, sordide flavescens, linea serpentina nigra determinata. *Verrucæ* apotheciorum sparsæ, primo a crustæ membranula subvelatæ apparent, sed sæpissime denudatæ occurrunt, parum supra crustam elevatæ ac convexiusculæ, demum planæ, albissimæ byssaceo-pulverulentæ, juniores oblongæ magis regulares, vetustiores difformes margine subrepandæ. *Apothecia* oblongo-sphæroidea minuta subpulveracea vel in centro parum solidiora atra, et ad verrucarum superficiem sparsa, quam nigro-punctatam reddunt absque signo papillæ genuinæ, et intra substantiam verrucarum seriatim disposita, flavedine quadam parenchymatis verrucæ plus minus evidente circumdata.

OBS. Descriptionem speciei, quæ in *Actis Gorenk.* l. c. habetur, heic emendatam et correctiorem tradere debui, postquam de partium natura et de genere ipso magis illustrati sumus. Sub vitris compositis maxime augentibus nullum intra apothecia partialia nucleum verum detegere potui, quare etiam dubitanter ad *Trypethelii* genus ibidem retuli, et licet apotheciorum verrucæ et apothecia ipsa iconibus ad augmentum factis antea in Actis hisce illustrata sunt, tamen superfluum esse non putavi, harum partium figuras iterum fideliter tradere, ut comparatio specierum evidentior fieret, in primis dum adhuc nescimus, an sub incendio Moscoviæ perierunt Societ. Gorenkens. Acta.

Explic.

Explic. Icon. Tab. III. fig. 3.—a. Crusta Lichenis cum apotheciis in corticis frustulo, magn. naturali.—b. Eædem partes magn. aucta.—c. et d. Verrucæ apotheciorum solitariæ cum parte crustæ ambientis supra visæ, magn. multum aucta, quarum prima (c.) verrucam juniorem integriusculam exhibet, ex apotheciis in ejus superficie subprominulis nigro-punctatam—secunda (d.) ætate provectiorem et supra omnino denudatam magisque deformem, in qua etiam apothecia fere tota denudata occurrunt.—e. Verruca alia horizontaliter resecta, formam et dispositionem subconcatenatam apotheciorum intra ejus substantiam exponens.

VIII. *On*

VIII. *On the Power of Sarracenia adunca to entrap Insects. In a Letter to Sir James E. Smith, Pres. Linn. Soc., from James Macbride, M.D. of South Carolina.*

Read December 19, 1815.

Sir,

Your remarks on the œconomy of the *Sarraceniæ* in your *Introduction to Botany*, led me to think of making this communication; and I was emboldened to undertake it from having observed in your prefatory remarks on the study of this science, a spirit of peculiar liberality and disinterestedness. My object is to lay before you the result of my observations on the insect-destroying-process carried on by the tubular leaves of these plants.

It will hardly be necessary to inform you that the *Sarracenia flava* and *S. adunca* (*S. minor* of Walter, and *S. variolaris* of Michaux,) grow in the flat country of this state in great abundance. With the latter my experiments have been chiefly conducted. If, in the months of May, June, or July, when the leaves of these plants perform their extraordinary functions in the greatest perfection, some of them be removed to a house and fixed in an erect position, it will soon be perceived that flies are attracted by them. These insects immediately approach the fauces of the leaves, and leaning over their edges appear to sip with eagerness something from their internal surfaces. In this position they linger; but at length, allured as it would seem by the pleasure of taste, they enter the tubes. The fly which has thus changed its situation, will be seen to stand unsteadily, it totters for a few seconds, slips,

and

and falls to the bottom of the tube, where it is either drowned, or attempts in vain to ascend against the points of the hairs. The fly seldom takes wing in its fall and escapes; but this sometimes happens, especially where the hood has been removed to assist observation. In a house much infested by flies, this entrapment goes on so rapidly that a tube is filled in a few hours, and it becomes necessary to add water, the natural quantity being insufficient to drown the imprisoned insects. The leaves of the *S. adunca* and *S. rubra* of Walter might well be employed as fly-catchers; indeed I am credibly informed they are in some neighbourhoods. The leaves of the *flava*, although they are very capacious, and often grow to the height of three feet or more, are never found to contain so many insects as the leaves of the species above mentioned. The spreading fauces and erect appendices of the leaves of this species render them (I suppose) less destructive.

The cause which attracts flies is evidently a sweet viscid substance*, resembling honey, secreted by, or exuding from, the internal surface of the tube. On splitting a leaf it may readily be discovered in front, just below the margin, and in greatest quantity at the termination of the *ala ventralis*. From the margin, where it commences, it does not extend lower than one-fourth of an inch. During the vernal and summer months it is very perceptible to the eye and touch; and although it may be sometimes not discoverable by either, yet the sensation of sweetness is readily perceived on applying the tongue to this portion of surface. In warm and dry weather it becomes inspissated, resembling a whitish membrane.

* This substance it seems was noticed by Bartram the younger (see the Preface to his Travels). I was entirely ignorant of his conjectures respecting it, until long after I had proved their correctness.

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The falling of the insect as soon as it enters the tube is wholly attributable to the downward or inverted position of the hairs of the internal surface of the leaf. At the bottom of a tube, split open, the hairs are plainly discernible pointing downwards; and as the eye ranges upwards they become gradually shorter and attenuated, till at, or just below, the surface covered with the bait, they are no longer perceptible to the naked eye, nor to the most delicate touch. It is here that the fly cannot take a hold sufficiently strong to support itself, but falls. The inability of insects to crawl up against the points of the hairs I have often tested in the most satisfactory manner. Spiders descend into the tubes, to prey (I suppose) on the entrapped insects, and ascend with impunity; but this is performed, as I have witnessed, by the assistance of their threads. Also a small species of *Phalæna** appears to take shelter in these tubes during the day, and is enabled to ascend; but by what contrivance I am at a loss to conjecture, unless it be by some peculiarity of structure in its feet.

In the putrid masses of insects thus collected, are always to be seen one or more maggots in a very active state. To account for their presence, and to ascertain the insect to which they belonged, I was long unable. The mystery was however unveiled in the following manner: While watching attentively some tall tubes of the *S. flava* growing in their natural situations, in order to discover whether other insects as well as flies were attracted by the bait above described, a large fly caught my attention: it passed rapidly from one tube to another, delaying scarcely a moment at the faux of each, until it found, as it should seem, one

* This *Phalæna*, which is about half an inch in length, may be described by saying it is divided transversely into three equal parts; the first division including the head is black; the second dirty white, or yellow; the third is like the first: Larva a greenish geometra.

suitable

suitable to its purpose; then hanging its posterior extremity over the margin, it ejected on the internal surface of the tube a larva with a black head, which immediately proceeded downwards by a brisk vermicular motion. This viviparous musca was more than double the size of the common house-fly, had a reddish head, and the body hairy, and streaked grayish. I had often noticed it before among the *S. aduncæ*, but could never ascertain its object; the hoods probably obstructing my view.

That insects may be found in these tubes which were not allured by the bait, I have well ascertained. At the time that I discovered the origin of the larvæ, I observed a beetle (*Scarabæus carnifex*, a herd being near) in its flight strike against the erect appendage of the *S. flava* and fall into the tube. In the leaves of the *S. adunca*, growing on the margin of a large pool, I once observed the fragments of a large *Gryllus* and several *Gyrini*. These and similar appearances have led me to suspect that our large *Nepa**, an extremely voracious insect, may occasionally use these tubes as storehouses. The hooked feet of this last insect would doubtless enable it to ascend against the inverted pubescence.

What purposes beneficial to the growth of these plants may be effected by the putrid masses of insects, I have never ascertained; but I learn from a hint given in the article *Dionæa*, in Rees's *Cyclopædia*, that it has been discovered that the air evolved is wholesome to the plants. I once entertained a suspicion that this air might be of such a deleterious nature as to cause the precipitation of the insects exposed to it, but I have long since relinquished it as entirely groundless.

* Very nearly allied to *Nepa grandis* of South America. It is very strong, and often destroys the Spring Frog. It inserts the claws of the two fore-feet into one of the frog's hind legs, and with the claws of its hind feet it grapples rice-stubble, or some aquatic plant; the frog unable to disengage itself becomes exhausted by struggling.

coquillages marins alternativement submergés et exposés à la chaleur du soleil, mais bien celle de ce liquide saturé de soude et de chaux muriatées et sujets à une évaporation que la température du climat nécessite.

De l'évaporation des liquides qui tiennent des solides en solution, résulte naturellement la précipitation de ces derniers. Mais comme il importe fort peu de considérer ici le corps précipité quant à la forme qu'il peut affecter en pareil cas, nous nous bornerons à observer, que les débris agglutinés des coquillages marins, infiltrés par l'eau de la mer, que la chaleur du soleil évapore sans cesse, reçoivent entre leurs interstices la chaux et la soude muriatées que ce liquide dissolvait, que la précipitation et une certaine adhérence de ces sels, envers ces débris agglutinés des coquilles, ont du déterminer une réunion plus parfaite de ces derniers, en devenant eux-mêmes parties constituantes de la masse pierreuse qui en est résultée par la suite. Examinons maintenant ce produit de la nature à l'endroit de son gisement et de sa formation.

La configuration et le rapport des masses sont certainement les premiers caractères qui doivent être spécifiés; mais ici nulle forme régulière ou constante ne se laisse appercevoir; nul rapport de position ou de nature ne parait exister entre le minéral dont il est question et les autres minéraux dont il est environné. Les débris agglutinés des coquilles auxquels ce premier doit sa formation figurent ordinairement à leur surface les ondulations de la mer, résultât de l'influence des marées ascendantes sur ces mêmes débris d'abord réunis par une faible adhérence. L'espèce de pierre qui provient de leur réunion est bien évidemment de formation nouvelle, et nous pouvons même dire journalière, ainsi que l'on peut s'en convaincre aisément sur le lieu.

Il n'est pas difficile de reconnaître ni même de distinguer à la vue

vue simple les premiers matériaux dont cette pierre est composée; il est évident, au contraire, qu'elle doit sa formation aux débris des coquillages marins qui se sont réunis, ainsi que nous l'avons déjà dit, par l'intermède de la chaux et de la soude muriatées déposées entre leurs interstices.

Une adhérence très-faible et presque nulle caractérise le premier état d'agrégation des débris des coquillages marins, et nous oblige à ne considérer leur réunion que comme un état d'agglutination, en la définissant de la manière suivante :

1. *Agrégat par agglutination, à gros grains, très-poreux et très-friable.*

Une agglutination plus intime, ou une adhérence, toutefois *indirecte**, réunit les débris des coquillages marins un une masse beaucoup moins fragile, qui peut être spécifiée par la dénomination de

2. *Agrégat par adhérence à gros grains, poreux et non friable; composé de chaux muriatée, de soude muriatée, et des débris des coquillages marins.*

Le troisième état de réunion de ces mêmes débris se distinguera par la définition de

3. *Agrégat adhérent, compacte, ou à grains resserrés de même nature que le précédent.*

Une adhérence plus parfaite de ces débris des coquilles, dans laquelle les parties hétérogènes réunies se trouvent confondues en un tout ou une masse à peu près homogène, peut admettre la co-

* Nous disons *indirecte* parcequ'il est démontré que les débris des coquillages marins ne sont point réunis par une adhérence réciproque, mais bien par l'adhérence intermédiaire de la soude et de la chaux muriatées pour ces mêmes débris.

hérence

hérence pour définition. Ainsi nous déterminerons ce quatrième état par les caractères de

4. *Agrégat cohérent, de même nature que le dernier, d'un gris jaunâtre, d'une saveur légèrement salée; semi-transparent sur les bords seulement; rayé par le verre, et rayant la chaux fluatée; répandant une odeur animale par le frottement; inphosphorescent; fortement sonore; réductible en chaux vive; soluble en entier et avec une forte effervescence dans l'acide nitrique dilué.*

C'est sous ce quatrième état que les débris des coquillages marins réunis peuvent admettre la dénomination de pierre, et se ranger parmi les autres minéraux sous le nom *d'agrégat composé de chaux carbonatée unie à la chaux et à la soude muriatées.* Mais, outre que cette espèce de pierre se distingue, en admettant dans sa formation ces deux derniers sels, des concrétions calcaires carbonatées, que nous fournissent les lithophites et quelquefois les zoophites, elle se caractérise encore par un degré de dureté, que nous venons de déterminer par sa propriété de rayer la chaux fluatée, et par une pesanteur spécifique beaucoup plus grande que celle de la chaux carbonatée ordinaire.

Il ne sera, sans doute, pas hors de propos de donner maintenant une courte énumération des différens vers testacés, dont nous avons pu reconnaître les dépouilles, puisque de cette manière nous indiquerons les coquillages marins, dont les débris d'abord agglutinés, bientôt adhérens et enfin cohérens, ont produit l'espèce de pierre dont nous venons de retracer tous les caractères ;. ceci nous menera encore à connaître les diverses incrustations que l'on peut rencontrer dans cette pierre par de plus amples recherches; mais il conviendra aussi de faire observer que cette énumération locale ne peut donner qu'une idée très-bornée de la *Conchyliologie des Antilles.*

Le

Le genre *Cypræa* de Linné se fait connaître par les espèces suivantes :

Le Cypræa *Pediculus.*
——————— *stercoraria.*
——————— *Exanthema et Zebra.*

Ces deux dernières espèces ne sont suivant Bruguieres que la même coquille plus ou moins avancée en âge.

Parmi les Buccins l'on trouve

Le Buccinum *cornutum.*
——————— *Perdix.*
——————— *Dolium.*

Dans les autres genres l'on rencontre la *Voluta Oliva ;* le *Murex ramosus ;* la *Bulla Ampulla ;* la *Bulla gibbosa ;* la *Nerita versicolor ;* la *Nerita peloronta ;* le *Strombus Lambis ;* le *Turbo Pica ;* le *Trochus niloticus,* et plusieurs espèces de *Patella.*

Toutes ces coquilles, ainsi que tous les corps qui se trouvaient interposés parmi leurs débris concassés, ont du nécessairement s'y incruster, du moment que ces débris se sont agglutinés. C'est pourquoi l'on y rencontre aujourd'hui, outre ces différens coquillages marins, quelques coquilles terrestres, des morceaux de poterie ou de terre cuite, des haches en pierre, instrumens dont se servaient les naturels du pays ; des ossemens humains isolés, et même des squelettes entiers plus ou moins bien conservés.

Non seulement la nature de tous ces objets n'est point altérée, mais de plus les coquilles se trouvent incrustées sans avoir perdu leur nacre et leurs couleurs. C'est donc à tort que l'on a vulgairement confondu jusqu'à ce jour l'incrustation de ces substances avec celles que l'on désigne communément sous le nom de pétrifications.

SUR L'ORIGINE DES SQUELETTES.

Les apparences nous portent à présumer d'abord, que les squelettes que l'on trouve au bord de la mer à l'est du bourg du Moule, sont les charpentes d'autant de cadavres *déposés* dans ce lieu. Nos premières observations nous autorisaient d'autant plus à adhérer à cette opinion, que le squelette* que nous cherchons à extraire aujourd'hui se trouve dans une position qui paraitrait confirmer ce que nous avons avancé à ce sujet.

Les anciens du quartier prétendent néanmoins que cette opinion est mal fondée ; ils nous assurent, que cet endroit, où l'on a découvert successivement différens squelettes, était autrefois un carbet ; que ce carbet fut également habité par des Indiens de deux nations différentes, dont les uns connus sous le nom de Caraïbes étaient des hommes petits ou de moyenne grandeur, peu robustes, ayant les cheveux noirs assez longs ; et le teint d'un brun assez foncé. Les Galibis, au contraire, qui formaient l'autre nation de ces Indiens, étaient d'une stature extraordinaire de six pieds au moins, très-forte ; ils avaient également les cheveux noirs et très longs, mais le teint de ces derniers était d'un jaune olivâtre, même un peu basané.

La plûpart des habitans du quartier du Moule s'accordent à admettre la co-existence de deux nations d'Indiens, même jusqu'à une époque bien postérieure à la découverte des colonies : quelques uns d'entr'eux ajoutent : que les Galibis habitaient une partie du quartier du Moule, le quartier du Port-Louis, et l'Anse Berrand, tandis que les Caraïbes occupaient le quartier de St. Anne, celui de St. François, et une partie de celui du Moule, où la

* For an account of this skeleton, see *Philosophical Transactions* for the year 1814, p. 107.

rivière

rivière servait de ligne de démarcation convenue entre ces deux peuples.

Quoique ces différens rapports ne soient point denués de vraisemblance ou de probabilité, ils ne font toutefois point mention de l'époque à laquelle il faut remonter, pour retrouver ces deux classes différentes d'Indiens, ni du tems présumable de leur dispersion, émigration, ou déstruction.

Un particulier, homme digne de foi, nous assure cependant, que la déstruction de ce carbet et la dispersion des Indiens qui l'habitaient ne remontent point à une époque très-reculée. Il nous dit: que son père, qui mourut à un âge très-avancé, lui a raconté maintefois, non seulement, qu'il avait eu connaissance du carbet, que l'on dit avoir existé dans ce lieu, et des deux sectes d'Indiens qui l'habitaient, mais qu'il se rappellait de plus, que vers les années 1710 et 1711, une rixe s'était élevée entre les habitans de ce carbet, et que les deux nations entières intervinrent dans cette querelle. Un combat eut lieu dans ce-même endroit, ajouta le vieillard, et un grand massacre s'ensuivit. Les Galibis furent battus et dispersés, tandis que les Caraïbes vainqueurs restèrent maîtres du champ de bataille. Il se fit sans doute alors une émigration des Galibis qui survecurent à cette triste défaite, car il ne fut plus mention d'eux depuis cette époque.

Ce même vieillard raconta encore à son fils, qu'il s'était rendu sur le lieu quelque tems après cet évènement, et qu'il vit quinze à vingt cadavres étendus sur le carreau. Les squelettes de ces cadavres furent encore reconnus il y a quarante ans environ par le particulier qui nous a fourni ces renseignemens, ainsi que par plusieurs habitans du Moule. A cette époque, ces squelettes commençaient à s'incruster dans les débris agglutinés des coquilles dont toute la côte est meublée. Ce particulier observe toutefois

que l'on pouvait alors en détacher ces squelettes au moyen d'un simple morceau de bois.

La position dans laquelle l'on a trouvé de nos jours, dans cet endroit, des squelettes incrustés dans la pierre, paraitrait devoir nous éclairer, quant à la vérité des faits que nous venons d'exposer. Il n'y a que quelques années, qu'un squelette fut déterré et enlevé avec une pierre d'incrustation, de formation nouvelle (ainsi que l'on pouvait en juger par l'extrême friabilité de cette pierre). Ce squelette* fut trouvé dans la position d'un homme assis à terre et dont les talons rapprochés du *rectum* ramenaient les genoux à une très grande proximité de la tête ; les bras un peu repliés sur eux mêmes étaient appuyés sur les genoux. Ce genre de sépulture a été, dit-on, celui adopté de tout tems par les Caraïbes ; nous ne pouvons donc rien inférer de l'exposition de ce fait. Le squelette dont nous surveillons aujourd'hui l'extraction est étendu sur le dos dans toute sa longueur, et parait un peu incliné sur le côté gauche. Il serait encore difficile ici de pouvoir déduire une conséquence dont nous puissions être satisfaits, et de prouver que le cadavre auquel ce squelette a appartenu n'ait point été enterré de cette manière. Tout ce que l'on peut conclure de la différente position des deux squelettes dont il vient d'être parlé, c'est qu'en admettant, qu'ils aient reçu l'un et l'autre la sépulture, ils paraissent avoir appartenu à des individus de nation différente, ou chez qui les usages différaient à l'égard de l'inhumation.

Il convient donc encore de nous en rapporter ici à la tradition ; des témoins oculaires s'accordent à attester, que les différens squelettes qui se trouvaient au bord de la mer, à l'endroit du

* Voyez L'Histoire Naturelle et Morale des Isles Antilles de l'Amérique. Rotterdam, 1658, 4to. p. 310.

carbet,

carbet, étaient dispersés ; que des membres étaient épars, et que la position de ces squelettes n'était nullement analogue à celle que l'on pourrait supposer à des cadavres enterrés, d'autant plus qu'elle n'était point la même partout. Des ossemens isolés se trouvent encore aujourd'hui sur le même lieu ; des arcs, des fleches, des haches ont également été trouvés à différentes époques par les habitans du quartier.

Au Moule, ce 15 Avril 1806.

X. *De-*

X. *Descriptions of a new Genus of Plants named Araujia, and of a new Species of Passiflora. By Felix de Avellar Brotero, Professor of Botany in the University of Coimbra, F.M.L.S.*

Read November 7, 1815.

ARAUJIA.

Character Genericus.

Calyx magnus, profundè quinquepartitus, persistens. *Corolla* campanulata, basi subglobosa, quinquegibba, tubo infra medium coarctato, limbo quinquefido. *Nectaria* sacculi quinque gibbosi, in fundo corollæ inter antherarum filamenta decurrentia, in quorum decursu squama horizontalis et auricula terminalis. *Styli* duo brevissimi; *Stigma* utrisque commune ovatum, apice bicorni. *Folliculi* duo oppositi, deorsum flexi, coriaceo-fungosi, subovales, semi-biloculares: dissepimento eorum ad centrum, seu medium, protenso, utrinque multilamellato. *Semina* numerosa, lamellis dissepimenti adhærentia, comâ longâ sericiformi coronata.

Araujia sericofera.

A. caule fruticoso, scandente; foliis cordatis, integerrimis, glabris, ad petioli apicem glandulosis; racemis paucifloris.

Radix perennis, ramosa, serpens.

Caulis fruticosus, debilis, scandens, teres, glaber, infernè pennæ anserinæ supernè gallinaceæ crassitudine, tres quatuorve pedes et

et ultra longus, succo lacteo refertus, (uti flores, fructus, et tota planta,) ramosus, ramis glabris, junioribus subtomentosis, oppositis, patentibus, interdùm uno ex ipsis in oppositione abortiente, aut seriùs pullulante, nec paucis ad idem latus sursùm reversis.

Folia opposita, oblongo-cordata, acuta, patentia, (nonnulla interdùm secunda,) venosa, integerrima, suprà saturatè viridia, glabra, basi prope petioli apicem duabus tribusve glandulis minimis instructa, subtùs dilutè viridia, seu subglauca, glabra, sed lente visa subtomentosa, tres quatuorve uncias longa, novem ad quatuordecim lineas in basi lata: petiolus subteres, suprà canaliculatus, glaber, aut lente visus subtomentosus, triplo quadruplove folii laminâ brevior.

Flores racemosi; racemi penduli, simplices, pauciflori, quorum flores plures sæpè abortivi; inferiores floribus quinque ad septem alii versus caulis ramorumque apicem numero florum sensìm decrescentes. *Pedunculus* communis extùs è latere axillæ foliorum exortus, teres, glaber, patens aut cernuus, semi-unciam plus minùsve longus, partialibus brevior: *Pedicellus* infimi floris uni majori bracteæ oppositus unciam aut paulò ultra longus, uti quoque pedicellus terminalis; alii breviores, ex bractearum oppositarum axillis exorti, et non rarò infra medium duabus aliis bracteis minoribus oppositis instructi. *Bracteæ* omnes sessiles, lanceolatæ, integerrimæ, utrinque glabræ, virides, patulæ.

Cal. Perianthium monophyllum, magnum, ita profundè quinquepartitum, ut ferè pentaphyllum videatur, persistens; laciniis lato-lanceolatis, acutis, integerrimis, utrinque glabris et dilutè viridibus aut interdùm extùs sordidè subpurpureis, primùm erecto-patulis, dein patentibus, altitudine inter sese æqualibus,

rariùs

rariùs latitudine subæqualibus, corollâ brevioribus, quinque ad septem lineas longis, tres ad quinque in medio latis.

Corolla monopetala, campanulata; infernè subglobosa, obtusa, pentagona seu quinquegibba, gibbis ex viridi flavis, singulæ limbi laciniæ oppositis; tubo infra medium ad organa sexualia coarctato, exinde laxiusculo, extùs usque ad limbi lacinias sordidè purpureo; quinquefida, laciniis tubo brevioribus, ovatis, obtusiusculis, leviter revolutis obliquatisque; intùs, ex apice usque ad tubi coarctationem, venis striisque variis saturatè purpureis pulchrè picta, exinde zonâ albâ, villosâ, ad lineas duas latâ, cincta; fundus ventricosus, sacculis quinque glabris albisque instructus, suprà tenui membranâ marginatus, centro in tubulum crassum, conicum, decurrentibus staminum filamentis coadunatum, germina arctè involventem, et stigmate clausum, sursùm producto. Ejus ima basis perforata, quâ receptaculo adhæret, sesquilineæ duarumve linearum diametro, vix constat; ex ipsâ usque ad limbi lacinias decem undecimve lineas longa est, et diametro linearum ferè quinque inter fundi gibbas gaudet. Post anthesin facilè decidit.

Nectaria, non squamulæ neque auriculæ, sed sacculi, qui, staminum inter filamenta curva decurrentia, gibbas extrorsùm efficiunt, et sub laxis antherarum commissuras ex opposito siti sunt; in istis enim sacculis succus melleus, ex prædictis commissuris exsudatus, continetur.

Stam. filamenta quinque, alba, crassa, plana, deorsùm sensìm latiora, per corollæ fundum arcuatè decurrentia, ex ipso demùm exerta auriculis ad antheras conniventibus terminantur; supernè rimis vix apparentibus inter sese distincta, infernè in fundo corollæ inter sacculos quinque distantia; intùs tubulo centrali conico ipsius fundi adnata; paulò sub antheris, squamâ horizontali

horizontali albâ, brevi, latâ, leviter emarginatâ, obovatâ, sessili, instructa; hæ omnium filamentorum squamæ quinque coronam, seu stellulam, obsoletè pentagonam quasi effingunt; auriculæ, quibus singulorum cauda plana, extra fundi membranam marginalem soluta, terminatur, sunt squamis antherisque oppositæ, ipsis approximatæ, albæ, carnosæ, glabræ, obtusæ, hinc concavæ, absque ullis corniculis, inde convexæ; harum tres minores, ovatæ, extrorsùm ad corollam concavæ, duæ aliæ latiores, ovato-cordatæ, introrsùm ad antheras concavæ, et ad unius ex minoribus latera utrinque sitæ. Corollæ tubus, has supra auriculas quinque convergentes, coarctatur.

Antheræ quinque, cum corollæ laciniis alternantes, filamentis adnatæ, sagittatæ, germinum apicibus approximatæ, membranâ ovato-cordatâ, inflexâ, et stigmati arctè incumbente, terminatæ; utrinque alâ reversâ deorsùm sensìm latiore prominentioreque, demùm in denticulum rigidum fragilemque desinente, auctæ; vicinis aliarum antherarum alis similibus contiguæ, infernè verò intùs laxæ; biloculares, loculis pollinigeris apice introrsùm, sub membranâ terminali, dehiscentibus.

Pro polline, in utroque singulæ antheræ loculo, corpusculum compactum, ex viridi flavescens, planiusculum, spatulatum, intùs (lente visum) contextu cellulari granuloso succulento farctum, extùs cuticulâ scabrâ tectum, supernè lateraliter filo insertum; filum breve, elasticum, obliquum, apice basique ad insertiones nodosum, hyalinum, succis ex viridi flavescentibus conspurcatum, supernè ad tuberculi nigri latus prope basin adhærens: tuberculum nigrum ovale, extùs nitidum, intùs opacum, cartilagineum, medio sulcatum et quasi didymum, apice duabus squamulis ovalibus minimis, albis, hyalinis, stigmati adhærentibus, terminatum, antherarum alis, corollæque laciniis oppositum, uni ex quinque stigmatis foveolis ovalibus semi-

semi-immersum; ex alio ejus baseos latere aliud simile filum emittit, quod obliquè descendens corpusculo spatulato primi loculi proximæ antheræ similiter adhæret: unde singulum tuberculum duarum antherarum corpusculis spatulatis commune, et singula anthera filis hinc inde duorum tuberculorum corpuscula spatulata ministrat.

Pist. Germina duo approximata, ovata, acuminata, glabra, in tubulo seu cavitate conicâ centrali fundi corollæ cum stylis recondita. Styli duo graciles, teretes, brevissimi, mucroniformiter persistentes. Stigma utrisque commune, magnum, crassum, ovato-subglobosum, glabrum, apice leviter emarginatum, bicorne, corniculis incurvis, introrsùm canaliculatis; obsoletè quinquestriatum, inter strias foveolis quinque ovalibus, pro tuberculis quinque nigris recipiendis, succo ex viridi flavescente tinctis, excavatum; apicibus antherarum membranaceis ferè usque ad medium tectum; sub foveolis in ora baseos marginali emarginaturis quinque leviter notatum.

Per. Folliculi duo (quorum unus non raro abortit) oppositi, plus minùsve reflexi, oblongo-subovales, magni, tres ad quatuor uncias longi, unciam ad sesquiunciam et ultra in medio lati, coriaceo-fungosi, corio ad sesquilineam crasso, apice obtuso leviter mucronati, basi cavâ retusi, subrugosi, glabri, dilutè virides; intùs ex viridi albidi, à seminibus prementibus subalveolati, univalves, semibiloculares, extùs, quâ parte in florescentiâ contigui, longitudinaliter unisulcati, sulcoque conscissè dehiscentes.

Dissepimentum, seu seminum receptaculum, longitudinale hinc liberum et usque ad folliculi centrum aut paulò ultra protensum, inde ad ejus parietem sub sulco tenuiter adhærens, in matura verò dehiscentia omninò solutum, solumque ipsius basi et apici adhærens, latum, subcoriaceum, prope latus externum

sub

sub sulco, inque basi et apicc, nudum, cæterùm utrinque multipliciter alatum, alis, seu lamellis, membranaceis, ad quadraginta, latis, semilanceolatis, acutè deorsùm serratis, dentibus prope folliculi basin acutioribus, longioribus.

Semina numerosa, ad quingenta (nonnulla abortientia) deorsùm imbricata, immatura, internè prope comæ ortum, dissepimenti lamellarum dentibus adhærentia, in maturitate soluta, crassiuscula, compressa, ovato-oblonga, versus apicem attenuata, tuberculis obtusis mollibus instructa, hinc convexa inde subplana ibique in medio obsoletâ costâ notata, è castaneo fuscâ duas lineas cum dimidia longa, apice truncata, comosa. Coma pilosa; pilis numerosis, simplicissimis, albis, tenuissimis, sericiformibus, altitudine inæqualibus, in seminibus infimis ad duas uncias et ultra longis, in aliis sensim ad apicem folliculi brevioribus; in fructu immaturo omnibus inter sese adhærentibus, fasciculumque magnum, crassum, fibriforme constituentibus, in ipso autem maturo inter dissepimenti lamellas arctè contentis, demum divergenter solutis.

Seminum integumentum simplex, tenue, membranaceum, in vesiculas tuberculiformes hinc inde sparsas elevatum. Hilus in apice seminum truncato ad comæ ortum, ubi dens lamellæ affixus erat. Albumen, seu perisperma, integumento firmiter adhærens, crassiusculum, subcoriaceum, intùs sordidè seu ex cinereo albidum. Embryo longitudine albuminis, inversus, lacteus. Cotyledones duæ, oblongo-ellipticæ, foliaceæ. Radicula teretiuscula, cotyledonibus dimidio brevior, supera.

Habitat in Perû, unde sub nomine *Apocyni Peruviani* missum. In Regio Horto Olisiponensi autumno floret, fructus autem vere maturescit; ibi tota planta pluribus abhinc annis frigus hybernum fert, et cicurata demum est: inodora, sed acris, cùm succis lacteis abundè plena sit, et ut videtur virosa.

Genus in honorem Illustrissimi ac Excellentissimi Viri Antonii de Araujo, Principi Portugal. Regenti à Secretioribus Consiliis Regnique pro re navali Administri, et Botanices Botanicorumque fautoris eximii, gratus dixi. Speciem à longis pilis sericiformibus, quos semina ferunt, nominavi: hi cum gossypio et serico misti ad eadem artificia, quibus Asclepiadis Syriacæ lanugo, seu coma seminum, inservit, valde aptiores recogniti sunt. Ad Contortarum Linnæi, et Apocinearum Jussiæi, ordinem naturalem attinet; non tamen cum ullo ipsius ordinis genere hucusque cognito confundendum, ab omnibus enim fructus florisque structurâ nimis compositâ singularique differt.

Quod ad organa sexualia Generis attinet, existimo corpusculum compactum, succulentum, ex viridi flavescens, quod singulum antherarum loculum occupat, verum sperma fœcundans continere, affine illi, quod in granulis antherarum Orchidearum secernitur, sed diversè perfectum stigmatique diversè applicatum; in Orchideis enim, liquore spermatico in granulis antherarum compactis completè præparato, exinde eorumdem granulorum fila, halitu quodam venereo, ex stigmatis mucositate emisso, irritata convergunt, ad istud immediatè applicantur, ipsumque liquore spermatico sensim ex sudato irrorant: in nostro autem Genere liquor spermaticus in corpusculis antherarum compactis non completè perficitur, sed quadam elaboratione in filis et tuberculo nigro perficienda indiget; quapropter, apertis antherarum loculis, liquor spermaticus imperfectus illico à vicinis filis proximè adhærentibus absorbetur, exinde per ipsorum vasa sensìm adscendens ad tubercula nigra pervenit, ibique demùm perfectè elaboratus ad stigmatis foveolas, per sulcum seu rimam internam singuli tuberculi, sensìm egreditur seu exsudat; unde per vasa spermatica stylorum et receptaculi ad ovula fœcundanda descendit. Hæc omnia ita se habere,

Weddell sc.

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Araujia sericofera.

habere, succi ex viridi flavescentes, quibus fila internè conspurcari videntur, nec non et stigmatis foveolæ quinque eisdem succis tinctæ suadent. Squamulas tàm antheris quàm tuberculis nigris natura dedit, ne liquor spermaticus humiditate aliquâ externâ misceretur, aut ipsi ne aëris nimia aliqua siccitas noceret.

EXPLICATIO.

Tab. IV.

Fig. 1. Caulis pars extrema et unus ramus lateralis florentes.
(*aa.*) Folia paginâ superiori visa.
(*bbb.*) Folia nonnulla ad idem latus versa, et paginâ inferiori visa.
(*ccc.*) Racemi.

EXPLICATIO.

Tab. V.

Fig. 1. Flos apertus magnitudine naturali visus.
2. Ejusdem calyx cum pistilli germinibus duobus visus.
3. Corolla calyce separata cum gibbis in basi.
4. Corolla verticaliter scissa et expansa, ut ipsius interna facies insimul cum auriculis quinque, quibus staminum cauda plana terminatur, conspicienda veniat.
5. Corolla infernè ad gibbas horizontaliter secta, ut sacculi videantur quinque nectariferi inter auriculas siti, et antherarum commissuris oppositi: in centro stigmatis cornicula duo, et circa ipsa antheræ transversè sectæ.
6. Eædem partes imâ corollâ sacculisque nectariferis nudatæ; sed auriculæ patentissimè positæ, ut meliùs conspiciantur.

Fig.

Fig. 7. Auriculæ duæ ita dissectæ, ut appareat modus quo in antheras et pistillum connivent.

8. Unius staminis anthera cum suo filamento crasso, plano, in auriculam desinente (hîc non arcuatìm, sed rectè depicto).

9. Anthera seorsùm posita.

10. Pistilli partes receptaculo insertæ (lente auctæ).

11. Eædem partes magnitudine naturali, et sine receptaculo, scilicet, germina duo, styli et stigma bicorne cum foveolis pro tuberculis nigris recipiendis.

12. Tubercula duo, singulum cum duobus corpusculis polliniferis, stigmatis foveolis applicata (lateraliter visa).

13. Tubercula omnia quinque, singulum cum suis duobus corpusculis polliniferis, stigmati applicata.

14. Tuberculum unum nigrum cum suis duobus corpusculis polliniferis, singulis è filo pendentibus (omnia magnitudine naturali).

15. Eædem partes lente auctæ.

16. Folliculi duo magnitudine naturali paulò minores.

17. Unus ex folliculis verticaliter sectus, ut semina et dissepimentum conspiciantur.

18. Dissepimentum cum suis lamellis serratis separatum.

19. Semen unum comâ piloso-sericiformi coronatum (magnitudine naturali).

20. Idem absque comâ, et verticaliter sectum, ut nucleus perisperma et embryonem continens videatur.

21. Idem lente auctum.

22. Idem transversè sectum.

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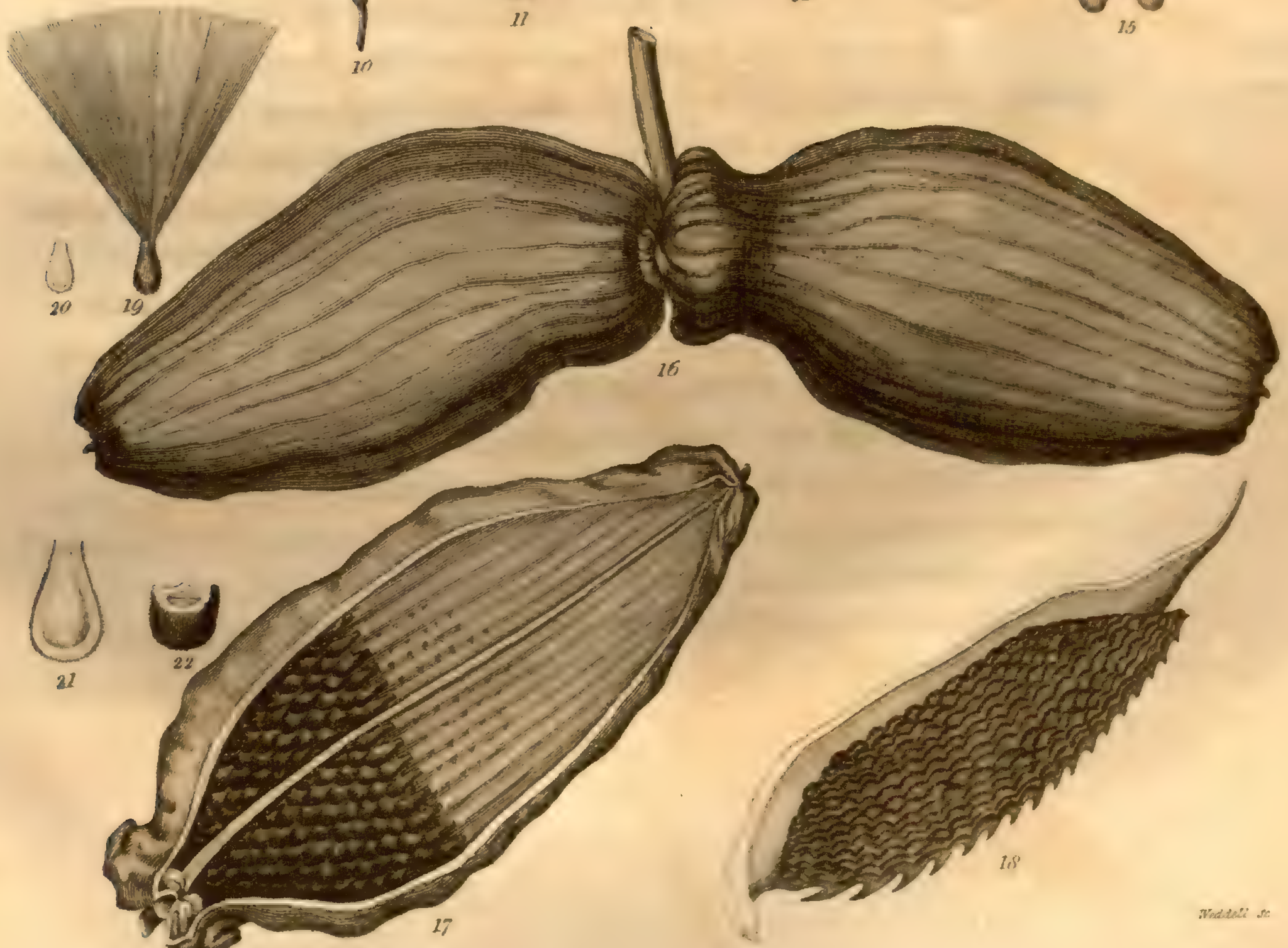
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PASSIFLORA RACEMOSA.

Martyrio cachudo (Lus. Bras.)

P. foliis subpeltatis, basi emarginatis, glabris, trilobis; lobis ovatis, acutiusculis, integerrimis, intermedio productiori; petiolis quadriglandulosis; floribus terminalibus, racemosis; calycis laciniis acinaciformibus, corollâ longioribus, apice introrsùm bicornibus.

TAB. VI.

Radix perennis, caule crassior, obconica, inque ramos obconicos infernè multifibratos, divisa. Inodora est, atque nullo alio sapore, nisi herbaceo, prædita, sicque totius plantæ partes aliæ sunt.

Caulis sarmentosus, teres, glaber, ut tota planta, infernè prope radicem crassitudine digiti, lignosus, subrimosus, nec tamen suberosus, supernè filiformis, crassitudine fili sutorii aut tenuior, altè arbores scandens, ramosus. Rami etiam filiformes, alterni, scandentes, superiores racemis terminati, penduli.

Folia alterna, duas ad quatuor uncias inter sese distantia, patentia, coriacea, utrinque glabra, saturatè viridia, impunctata, basi emarginata, subpeltata, omnia triloba (caulis infimis exceptis, quæ sæpe ovata) lobis ovatis, acutiusculis, integerrimis, medio latiori longiorique, lateralibus binerviis, sinubus obtusis, à basi ad lobi medii apicem tres ad quatuor uncias longa, transversè, inter lobos laterales, tres ad quatuor uncias cum dimidia lata.

Petiolus folii laminâ ferè dimidio brevior, sesquiunciam ad duas uncias aut paulò ultrà longus, subteres, basi articulatus, glandulis sæpiùs quatuor, sessilibus, ovatis, apice leviter concavis, instructus, quarum duæ infra ipsius medium suboppositæ, et

duæ

duæ aliæ paulò infra folii laminæ basin obliquæ inter sese distantes, sitæ sunt.

Ad basin et latus petioli stipulæ duæ solutæ, oppositæ, sessiles aut subsessiles, cauli appressæ, utrinque glabræ, integerrimæ, acutiusculæ, mucronatæ, ovatæ aut subcordato-ovatæ, basi obliquatæ, inæquilateræ, semilaminâ internâ dimidio angustiore, semiunciam ad fere unciam longæ, caducæ.

Inter stipulas, et in axillâ petioli, cirrhus filiformis, simplex, viridis, primùm rectè tensus, folio longior, demùm spiraliter tortus, folio æqualis aut brevior.

Flores in axillis foliorum nulli, sed ramos et caulem terminantes, racemosi, inodori. Caulis et ramorum apices sub racemo nudi, eorum nodi cirrhis solùm parati, et à casu foliorum stipularumque leviter tuberculati. Pedunculus communis (seu internodium supremum racemo immediatum) brevis. Racemus simplex, pendulus, aphyllus, et foliorum loco stipulis instructus. Ejus rachis, seu pedunculus communis prolongatus, cylindracea, septem, octo uncias et ultrà longa: interdùm, præsertìm cum nullos fructus alit, viva persistit, novosque ramulos ex emortuorum pedunculorum axillis protrudit.

Pedunculi partiales simplicissimi, sæpe novem ad tredecim, infimus et supremi sæpius solitarii, alii alternè bini, unciam aut paulò ultrà longi, teretes, ex patenti adscendentes (in fructûs verò maturitate penduli) paulò infra calycem articulati, ibique demùm à casu involucri trituberculati; basi inter binos, et sub solitariis, cirrhus brevis spiraliter tortus, ibidemque ad eorum latera stipulæ duæ oppositæ, adpressæ, versus apicem rachis sensìm minores, citò caducæ, ex omni parte illis, quæ ad petiolorum basin sitæ sunt, persimiles.

Floris involucrum ad duas lineas, duasve cum dimidia, infra calycem

calycem situm, triphyllum, foliolis ovatis, leviter inæquilateris, mucronatis, integerrimis, subsessilibus, glabris, erectis, primùm flori recenter è gemmâ evoluto subæqualibus, demùm calycis tubo paulò brevioribus, omnibus, sæpè multò ante floris apertionem, caducis.

Cal. perianthium inferum, glabrum, monophyllum, infernè tubulosum, limbo profundè quinquepartito ; laciniis petalis corollæ nonconformibus, extùs sordidè puniceis, latissimè carinatis, carinâ acinaciformi, intùs ferè usque ad apicem concavis, coccineis, apice introrsùm semilunato-bicornibus (corniculo superiori longiori uncinatoque) patentissimis, duas uncias cum dimidiâ longis, tres lineas et ultra in medio latis, simul cum corollâ marcescentibus ; tubo cylindraceo, obscurè subpuniceo, obsoletè decemlineato, duas ad tres lineas longo, infernè duas lineas aut paulò ultra lato. Dum inapertum, tumidè obconicum, argutissimè quinquangulum, profundè quinquesinuatum.

Corollæ petala quinque, fauci calycis inserta, ipsiusque laciniis $\frac{1}{3}$ ferè breviora, patentia, semilanceolata, obtusiuscula, integerrima, planiuscula, extùs levitèr carinata, intùs subcanaliculata, in solo natali utrinque coccinea.

Nectarium corona triplex, filamentosa, filis omnibus supernè albis, infernè cæruleis ; intima exteriori altitudine æqualis, filis circa stipitem cylindraceum conniventibus, inter sese æqualibus, simplicibus, infernè membranâ coalitis, margini receptaculi elevato, fundum calycis circumcingenti, adnatis ; duæ aliæ fauci calycis sub petalis insertæ, intermedia brevior, filis vix extra calycis faucem exertis, erectis, apice subcapitatis, inter sese æqualibus ; exterior filis simplicibus, duas tresve lineas extra calycis faucem prolongatis, patentibus, inæqualibus, illis, quæ calycis laciniis sunt opposita, longioribus.

Stam. filamenta quinque, summo stipiti sub germine inserta, basi

levitèr coalita, pallidè viridia, sublinearia, erecto-patula. Antheræ sublineares, obtusæ cum brevi acumine, incumbentes, ex viridi lutescentes, medio et lateribus unisulcatæ, bilobulares.

Pist. Germen superum, oblongum, subovale, obsoletè trisulcatum, glabrum, pallidè viride, apici stipitis insidens, qui ad unam unciam extra calycis faucem protenditur, cylindraceus, viridis, basi pentagonâ latior. Styli tres, supernè crassiores, pallidè virides, ad antheras recurvi. Stigmata capitata, ex lutescenti viridia.

Peric. Bacca pedicellata, ovalis, trisulcata, glabra, pallidè viridis, ad duas uncias longa, unilocularis, polysperma, carnosa, demùm exsucca.

Semina axillata, ovata, compressa, receptaculo triplici, quod cortici baccæ longitudinalitèr adnatum est, adhærentia.

Habitat in umbrosis sylvaticis inque solo glareoso littorali unam fere leucam ab urbe Riojaneriâ dissitis, et alibi in Brasiliâ. Floret Novembri, Decembri. Frutex sarmentosus, ob pulcherrimos flores sat dignum hortorum ornamentum.

Hanc novam speciem clariss. E. I. A. Woodford, botanices diligentissimus, in Brasiliâ invenit, in Europam secum transvexit, et mecum, uti alias quoque stirpes rariores in horto suo Olisiponensi cultas, benevolè communicavit. Quantùm ab omnibus aliis hucusque cognitis congeneribus differat, ex florescentiâ racemosâ, calycis formâ, et aliis notis in descriptione positis, abundè patet.

Obs. In solo natali caules duos ex eâdem radice sæpè fert, quorum unus altè scandens, et omninò defoliatus fructificat; alter foliatus, scandens aut procumbens, tardiùs, hoc est, uno aliove anno transacto postquàm primus fructus tulit, florifer. Variat in Europâ 1°. Aliquorum foliorum petiolis triglandulosis aut quinque-

Linn. Trans. Vol. XII. Tab. 6. p. 73.

Passiflora racemosa.

Maddox sc.

quinqueglandulosis, nec quadriglandulosis; 2°. Calyce et corollâ plùs minùsve puniceis, nec coccineis; 3°. Nectarii filis albidis, infernè virescentibus, nec cæruleis.

EXPLICATIO.

Tab. VI.

Fig. 1. Unius rami nondum florentis pars extrema cum foliis, stipulis et cirrhis.

(*a.*) Folii petiolus cum glandulis quatuor.

(*b.*) Stipulæ.

(*c.*) Cirrhus.

Fig. 2. Alterius rami pars extrema nuda, racemosa.

(A.) Racemi ex arbore vicinâ penduli pedunculus communis.

(*aaaaa.*) Floris primarii aperti calycinæ laciniæ, dorso acinaciformes, apice bicornes.

(*bbbbb.*) Corollæ petala.

(B.) Staminum antheræ, et filamenta stipiti summo inserta.

(C.) Stigmata et styli cum germine apici stipitis insidente.

(DD.) Nectarii corona triplex.

(EE.) Pedunculi partiales, alternè bini, cum cirrho inter ipsos spiralitèr torto.

(*c.*) Pedunculi articulatio.

(*d.*) Calycis pars inferior tubulosa.

(*e.*) Calycis pars superior inaperti quinquangula.

(F.) Unus ex floribus extremis involucratus.

(G.) Racemi pars extrema cum stipulis, et nonnullis floribus involucro penitùs tectis.

Fig. 3. Unius floris recentèr è gemmâ evoluti involucrum triphyllum: (*a.*) ejusdem foliolum separatum.

Fig. 4. Bacca matura.

XI. *Some Observations on the natural Family of Plants called* Compositæ. *By Robert Brown, Esq. F.R.S. Libr. L.S.*

Read Feb. 6 and 20, 1816.

The class *Syngenesia* of the Linnean artificial system, as at present limited, constitutes a family strictly natural, and by far the most extensive in the vegetable kingdom. It is also, with the exception of Grasses only, the most generally diffused, and is almost equally remarkable with that order, for the great apparent uniformity in the structure of its essential parts of fructification.

This class of plants, for which I retain the established name Compositæ, in preference to any of those recently proposed, has lately become the subject of a minute and accurate examination by Mons. Henri Cassini; two of whose Memoirs on the Style and Stamina of the class, already published in the Journal de Physique*, are in my opinion models for botanical investigation.

A few years before the publication of M. Cassini's Memoirs on Compositæ I was induced to examine a considerable part of this extensive family, chiefly with a view to the more accurate determination of the New Holland plants belonging to it.

My principal object in the present paper is to communicate such general observations, the results of this investigation, as either have not yet been published by M. Cassini, or respecting which I consider myself to have anticipated that author in my General Remarks

* Of 1813 and 1814.

on

on the Botany of New Holland, appended to Captain Flinders's Voyage to Terra Australis.

To these observations I shall add some remarks on certain genera of Compositæ, which occur repeatedly under different names in late systematic works, and whose structure and limits appear to be imperfectly understood.

My *first* observation relates to the peculiar disposition of the nerves or vessels of the corolla of this family of plants.

In the essay already mentioned, which appeared early in the summer of 1814, I have noticed this peculiarity in the following terms:

"The whole of Compositæ agree in two remarkable points of structure of their corolla; which, taken together at least, materially assist in determining the limits of the class. The first of these is its valvular æstivation; this however it has in common with several other families. The second I believe to be peculiar to the class, and hitherto unnoticed. It consists in the disposition of its fasciculi of vessels or nerves; these, which at their origin are generally equal in number to the divisions of the corolla, instead of being placed opposite to these divisions, and passing through their axes as in other plants, alternate with them; each of the vessels at the top of the tube dividing into two equal branches, running parallel to and near the margins of the corresponding laciniæ, within whose apices they unite. These, as they exist in the whole class and are in great part of it the only vessels observable, may be called primary. In several genera, however, other vessels occur, alternating with the primary, and occupying the axes of the laciniæ: in some cases these secondary vessels being most distinctly visible in the laciniæ, and becoming gradually fainter as they descend the tube, might be regarded as recurrent; originating from the united apices of the primary branches;

branches; but in other cases, where they are equally distinct at the base of the tube, this supposition cannot be admitted. A monopetalous corolla not splitting at the base is necessarily connected with this structure, which seems also peculiarly well adapted to the dense inflorescence of Compositæ; the vessels of the corolla and stamina being united and so disposed as to be least liable to suffer by pressure."

At the date of this publication I certainly had no knowledge of any similar observations having been previously made: but I now see in M. Cuvier's account of the proceedings of the Institute of France for 1815, that M. Cassini is considered as having anticipated me on this subject, and as he says in "termes non équivoques." What these terms are, appears by a letter I have received from M. Cassini himself, in which he states his claim to rest on the following passage:

"Chaque fleur hermaphrodite ou male contient cinq étamines, correspondant aux cinq nervures de la Corolle et *par conséquent* alternes avec ses lobes."

This passage occurs in a Memoir on the Stamina of Compositæ, which was read to the Institute of France in July 1813, and first appeared with the substance of that Memoir in the Journal de Physique, said to be for April 1814; but the actual date of the publication of which I have reason to believe was somewhat later, and very nearly corresponding with that at which M. de Jussieu was in possession of a copy of my essay containing the observations already quoted. I conclude it is not supposed I could have been acquainted with the passage in the original memoir, unless the report usually made on memoirs read to the Institute should have been printed, and should have actually noticed this passage or the discovery it is now said to contain.

But independently of the near equality of dates, I cannot consider

sider my observations as either wholly or even in any considerable degree anticipated by the passage in question. My observations notice not only the disposition of the five vessels in the tube of the corolla, but their ramification in the laciniæ, by no means a necessary consequence of that disposition; they notice also the existence, in several genera of Compositæ, of five vessels alternating with those, and which I considered secondary in this order, though they occupy the place of the primary vessels in other families: and it is this inverted disposition, indicated in the greater part of the class by the primary being the only vessels existing, which I have considered as of material importance in determining the limits of Compositæ, though by no means as affording an essential practical character for the whole class.

In the passage quoted from M. Cassini (the only one I can find relative to the subject in the memoir in which it occurs), the existence of five nerves or vessels in the tube of the corolla, alternating with its laciniæ, is stated, but their division and disposition in the laciniæ are not noticed; it is at the same time to be inferred from the terms of the passage, that no other vessels exist in the tube of the corolla: and it is equally evident that, so far from announcing this disposition of vessels as a discovery, or peculiar to the order, the author rather considers it either as a fact already known, or as the usual structure. That M. Cassini was not then aware of the importance of the fact which he had imperfectly stated, appears likewise from his having, many months after his memoir was read, and at a time when he says he had finished his analysis of the corolla, proposed a name for the class, taken from a supposed peculiarity in the structure of the filament, a name which he is now inclined to abandon for one derived from the disposition of vessels in the corolla.

Since

Since my attention has been again turned to the subject, I have endeavoured to collect all that has been observed on the nerves or vessels of the corolla of Compositæ, a brief account of which may be not altogether without interest.

The earliest notice I have been able to find is contained in a passage (in page 170) of Grew's Anatomy of Plants, where, in speaking of syngenesious flosculi, he says, "they are frequently ridged, or as it were hem'd like the edge of a band." And his figure of a magnified floret of the common Marigold, in tab. 61, gives a tolerable idea of the marginal vessels of its laciniæ. Grew however takes no notice of the trunks from which these branches arise, either in his text or plates.

Van Berkhey, in his Dissertation on Compositæ, published at Leyden in 1760, though he makes no mention of the nerves of the corolla in his text, yet in all the magnified figures he has given both of ligulate and tubular florets, correctly represents the trunks of the primary vessels, without however noticing their ramification in the laciniæ. I am anticipated therefore by this author's figures exactly in the same degree as by the passage contained in M. Cassini's second memoir.

The accurate Schmidel, in the few Compositæ which occur in his Icones, has correctly represented the trunks of the primary vessels, but has equally omitted their ramifications.

In the Analysis Florum of Batsch, a work published in 1790, the object of which was to give an idea of the structure of the natural families of plants, by a minute description and magnified figures of one or more species selected from each, *Coreopsis tripteris* occurs; and although the vessels of its tubular floret are very indistinctly figured, yet both their trunks and branches are correctly described. The same author however, who in 1802 published

lished an ingenious work on the natural families of plants*, takes no notice of the vessels of the corolla in the character of Compositæ which he has there proposed.

In the figures of syngenesious plants given by Schkuhr†, wherever the ligulæ of *Cichoraceæ* are magnified, the trunks of the nerves are correctly represented ending in the sinuses; unless in one plate containing *Lactuca virosa* and *Sonchus sibericus*, in both of which the vessels are made to pass through the axes of the teeth; but in no case are the marginal branches noticed. It is singular that this generally accurate author, in the many magnified figures he has given of tubular florets, has only in two cases represented the trunks of their vessels, namely in *Echinops Ritro*, where they are correctly placed, and in *Silphium trifoliatum*, where, though only five vessels are visible, they are erroneously made to pass through the axes of the laciniæ.

The only remaining author that notices these vessels is M. Mirbel, who in the second part of his valuable Elémens de Physiologie Végétale et de Botanique, published in 1815, introduces into his character of Compositæ the fact of the laciniæ of the corolla being furnished with marginal nerves. This observation, if not original, the author may have adopted either from my essay already quoted, of which he was in possession soon after its publication, or from M. Cassini's third memoir, which was read to the Institute of France six months after that essay appeared: but he could not have derived it from the passage in that author's second memoir, on which he rests his claim; no notice being there taken of the disposition of vessels in the laciniæ.

In M. Cassini's memoir expressly on the Corolla of Compositæ, which was read to the Institute of France in December 1814, and of which an abstract, by the author himself, is given in a late

* Tabulæ affinitatum regni vegetabilis.

† In Botanisches Handbuch.

number of the Nouveau Bulletin des Sciences, the disposition of vessels in the corolla is expressed in the following terms:

"Chacun des cinq petales dont se compose la corolle est muni de deux nervures très simples qui le bordent d'un bout à l'autre des deux côtés, et confluent par conséquent au sommet."

On this statement I have several remarks to offer. And first, I object to its hypothetical language. Whatever opinion may be formed of the theory here adopted by the author, namely, that every monopetalous corolla is in reality composed of several confluent petals; a theory first proposed by Linneus himself in his Prolepsis Plantarum, and ably supported on different grounds by Mons. Decandolle in his excellent Théorie Elémentaire de la Botanique; I can see no advantage in adopting its language in stating a fact of this kind, especially if proposed as a practical character.

For my own part, I consider this opinion as correct in the sense in which it was held by Linneus, without, however, connecting with it the ingenious hypothesis of M. Decandolle, namely, that petals are only modified stamina. It remains to be seen on what ground M. Cassini has adopted this theory, as proposed by M. Decandolle, for Compositæ, the only family which seems to present a very important objection to it, in having its principal, and in the greater part of the order its only, vessels occupying the lines of junction of the supposed united petals.

To adapt this disposition of vessels to the theory, M. Cassini is obliged to subdivide their apparently simple trunks; a division, however, which may be regarded as entirely hypothetical. From the observations I have made on the subject, I have no doubt that these trunks are equally simple with the secondary nerves when present, or with the primary in other families. I find them to consist of two kinds of vessels, the spiral and ligneous. Of the spiral

vessels

vessels there are generally several in the cord: in *Helianthus multiflorus*, however, I have not been able to find more than one, either in the trunk of the nerve above the insertion of stamina, or in the branches of the laciniæ. It will be of some interest to verify this fact (which I by no means give with absolute confidence), both on account of the apparently formidable objection it presents to the theory in question, and also that, in following it up by an examination of the point of division, a clearer idea may be obtained of the ramification of spiral vessels than has hitherto been given.

My second objection to M. Cassini's account is, that he describes the nerves as marginal through their whole length. I have formerly, in the passage already quoted, stated them to be parallel and approximated to the margins of the laciniæ. Perhaps in no instance can the branches be considered as strictly marginal; in many cases they are manifestly distinct from the margins, and in the genus *Hymenopappus* are further removed from them than from the axis of the laciniæ. In *H. scabiosæus* there is also an evident inequality of the two branches in each lacinia, the stronger extending nearly to the apex, while the weaker either entirely disappears before it reaches the stronger, or unites with it considerably below its termination. In *H. tenuifolius* this irregularity is still greater; one branch being not unfrequently altogether wanting, and even the remaining branch considerably weakened: where this happens a secondary vessel is always produced, though very few flosculi are furnished with five complete middle nerves.

To the fact stated by M. Cassini that the lateral nerves are always simple, I have met with only one apparent exception, in an unpublished species of *Madia*, where they are connected by a few branches with the secondary or middle nerve, which in this

plant is more strongly marked than the primary, and from which indeed these connecting branches probably originate.

It must, I think, be admitted by M. Cassini, that in many genera of Compositæ five vessels passing through the axes of the segments exist, even ten others are occasionally found, as in *Helianthus*, though these can hardly be traced below the insertion of stamina. But as it has been already shown that the lateral or primary vessels are not strictly marginal through their whole length, and as one instance has been produced in which their branches, if not themselves subdivided, are at least connected by ramifications of the middle nerves*, it follows that a monopetalous corolla having in its tube fifteen nerves with distinct origins, three of which are continued through each of its segments, and unite together at the apex, would upon the whole better correspond with the definition M. Cassini has given of the corolla of Compositæ, than the actual disposition of vessels in that order. Now such a structure exists in the whole of Goodenoviæ†, a family of plants very nearly related to

* M. Cassini himself (in a note to his third memoir published in the Journal de Physique for February 1816, p. 129) has given another instance of the ramification of nerves in *Iva frutescens*.

† I have formerly observed (in Prodr. Flor. Nov. Holl. p. 580, and in General Remarks on the Botany of Terra Australis) that *Euthales* and *Velleia*, genera belonging to *Goodenoviæ*, exhibit the remarkable and nearly peculiar character of a corolla having the lower part of the tube cohering with the ovarium, while the calyx is entirely distinct. I have at the same time remarked that, even in those genera of the same natural family in which the calyx is coherent, the tube of the corolla may be supposed to be continued down to the base of the ovarium; and that this becomes even evident in such species as have the adhering part dilated into nectariferous processes; or in those where, the segments of the calyx not being closely approximated, the coloured corolla is visible in the interstices. In some species of *Goodenia*, particularly *G. decurrens* and *bellidifolia*, I find it practicable to separate not only the adhering calyx, but also the tube of the corolla from the ovarium. In the tube thus separated it appears that the lateral nerves, which preserve their parallelism to the middle nerve nearly to the base of the segment, become more evidently divergent below the point

to Compositæ. It exists also in *Ernodea*, in which the lateral nerves, though they give out externally a few branches, observe the same course, and terminate in the same manner in the laciniæ as those of Compositæ. A similar disposition is observable in certain genera of Solanaceæ, as *Datura* and *Cestrum*, though in these the lateral nerves are more ramified; and their trunks generally less distinct in the laciniæ. It appears therefore that, in adopting M. Cassini's theoretical expression for the vascular structure of

point of adhesion, and in such a degree that the corresponding branches of the neighbouring segments unite with each other considerably above the middle of the tube, forming a common trunk, which is continued to the base of the ovarium; the five trunks thus formed uniting internally with those from which the filaments originate, and externally with the axes of the opposite segments of the calyx. The middle nerves of the segments of the corolla are in like manner continued below the point of cohesion to the real base of the tube.

The analogy of this disposition of vessels in the corolla of Goodenoviæ to that of Compositæ is obvious. To assimilate entirely the two structures, it is only necessary to suppose a deeper division of the five primary vessels of Compositæ, and a continuation of the tube of the corolla below its apparent base to that of the ovarium. That this is its real origin, is rendered not improbable both from the analogous structure now described in the family of *Goodenoviæ*, and from the manifestly hypogynous corolla of *Brunonia*; a genus in many respects still more nearly related to Compositæ, though differing in the disposition of the vessels of its corolla.

The more direct proof of this origin, derived from an examination of the surface itself, can hardly, perhaps, be expected where the parts are generally so small, and where, as I conceive, the surface of the pericarpium in many cases depends less on that of the cohering envelopes, than on the proper figure of the ovarium itself, as seems to be likewise the case in Umbellatæ.

There are however a few cases in which this opinion respecting the origin of corolla in Compositæ may derive some additional support from the appearance of the surface of the ovarium, as in *Marshallia* and *Hymenopappus*, in both of which genera, but particularly in the former, it is marked with ten longitudinal striæ, of which the five stronger are continued into the five nerves of the corolla, the remaining five ending abruptly at the apex of the ovarium.

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the corolla of Compositæ, one peculiarity actually existing is lost*.

The principal peculiarity, however, consists in the corolla of a syngenesious plant, when reduced to its smallest number of nerves, having these nerves alternating with its segments in the tube. I am acquainted with no instance of this order of reduction in the nerves of any other monopetalous corolla, but I observe an apparent tendency to it in *Portlandia* and *Catesbæa*. In the tube of the corolla of both these genera there are ten nerves, of which the five that alternate with the segments are manifestly stronger, and seem to furnish the greater part of the vascular system of the upper part of the tube and of the segments; the intermediate nerves being there somewhat like recurrent branches.

I shall conclude this subject by observing, that although the existence of nerves alternating with the segments of a monopetalous corolla, dividing below the sinus and uniting their branches at the apex of the segment, be rare, this disposition is comparatively frequent in a monophyllous calyx, especially where its æstivation is valvular. Labiatæ furnish the most striking examples of this structure. I am not however acquainted with any instance of a calyx having five nerves only, and those alternating with its segments.

The *æstivation* or condition of the corolla before expansion is the subject of my *second* remark on Compositæ. I have, in the

* A still stronger objection to M. Cassini's definition is, that while its application to Compositæ is only hypothetical, it very nearly corresponds with the actual disposition of vessels in certain polypetalous genera. Thus in *Pittosporum revolutum*, each of the petals has three nerves with distinct origins. Of these the two lateral, evidently within the margins, less so, however, than in *Hymenopappus*, are quite simple in the ungues, and ramify more or less in the laminæ, near the top of which they unite with each other and with the middle nerve.

observations

observations formerly quoted, stated this to be *valvular*, that is, having the margins of the segments applied to each other and dehiscing like the valves of a capsule. As I have remarked in the same place that this æstivation exists in several other families, it is rather surprising that M. Cassini, in the abstract of his third memoir given in the Nouveau Bulletin des Sciences for last October, should seem to consider this character as peculiar to Compositæ*. It appears also that he is not aware of any exception to it in the class. I have however, in a different part of the same essay, noticed one exception existing in *Chuquiraga*, and I have since found another in *Corymbium*. In both these genera the æstivation is induplicate, that is, the margins of the segments are doubled in, so that in the unexpanded state none of them are visible. I have

* Since this paper was read, M. Cassini has published his memoir (in the Journal de Physique for February 1816), in which he states the same æstivation to exist in certain other families, namely, Campanulaceæ, Lobeliaceæ, and Rubiaceæ. This observation, if applied to the whole of these families, as is evidently the author's intention, is correct only with respect to Campanulaceæ, from which I have separated Stylideæ as a distinct order, partly, as I have stated, on account of its imbricate æstivation. In a considerable part of the Lobeliaceæ of Jussieu, which includes my Goodenoviæ, the æstivation is not valvular but induplicate: and though in Rubiaceæ the valvular mode is very general, there are many remarkable exceptions to it, as *Gardenia*, *Ixora*, *Pavetta*, *Coffea*, and several other genera, where it is unilaterally and obliquely imbricate, as in most of the Apocineæ, with which Linneus united them under the name of Contortæ, derived from this very circumstance. On this subject I may be allowed further to remark, that M. Cassini, who in the memoir now cited has repeatedly asserted his claim to the priority of the observation on the disposition of vessels in the corolla, has in treating of its æstivation omitted to notice what had been already published respecting it in my essay above quoted, where I conclude he must have seen my observation, as he refers to the sentence containing it. The æstivation of corolla in Compositæ is also noticed in the observations on *Brunonia*, contained in my Prodromus Floræ Novæ Hollandiæ, which I suppose he has not seen: I may therefore, for the general importance of æstivation of calyx and corolla in affording characters both for Orders and Genera, refer him to almost every page of the same work, and to its preface, for an observation on the degree of attention that had been previously paid to this point of structure, which will enable him to correct in some measure his own remark on the subject.

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in the passage referred to observed that the valvular and induplicate modes of æstivation easily pass into each other, merely by an addition or abstraction of the elevated margins of the laciniæ: instances of their abstraction, and of the consequent conversion of the induplicate into the valvular mode, occur in several Goodenoviæ, and in some Convolvulaceæ and Solanaceæ; while *Chuquiraga* and *Corymbium* are examples of their addition in an order where they are generally wanting.

My *third* remark is entirely borrowed from Schkuhr*, who states that in all *Cichoraceæ* or Ligulatæ the pollen is angular, and that in *Corymbiferæ* and *Carduaceæ*, or in all tubular florets, it is spherical or oval.

All the figures which this author has given of pollen in Cichoraceæ represent it as a regular icosahedron, except that of *Geropogon glabrum*, which is a dodecahedron. I believe neither of these forms of pollen has been observed in any other family of plants.

A *fourth* remark on Compositæ I do not offer with absolute confidence, as it is opposed to the statement of M. Cassini, on whose general accuracy I have great reliance. It relates to the disposition of the branches of the style or stigmata, which according to M. Cassini are lateral, or right and left with relation to the axis of the common receptacle; whereas, I consider them as anterior and posterior, though in many cases by a slight degree of twisting in the style they acquire what M. Cassini regards as their original position.

This may seem a point of very little consequence to establish. Independent however of the necessity of minute accuracy in every case, it appears to me to have some connexion with my *fifth* remark, which relates to the internal structure of the Ova-

* Botanisches Handbuch 3. p. 8.

rium

rium of Compositæ. I am not aware of any thing having been yet said on this subject further than that it contains a single erect ovulum, inserted at the base of the cavity. In addition to this, I observe in the greater part of Compositæ, whose ovarium I have examined, two very slender filiform cords, which, originating from opposite points of the base of the ovulum, or of its short footstalk, run up, and are more or less connected with, the lateral parietes of the ovarium, until they unite at the top of its cavity, immediately under the style; between which and the ovulum a connexion is thus formed. In many cases, as in *Liatris spicata* and *Tussilago odorata*, these cords are easily separable from the ovarium, and have such a degree of tenacity that they may be extracted from it entire, along with the ovulum. In other cases they more firmly cohere with the sides of the cavity: and in those plants in which I have been unable to see them distinctly, I conclude they are not absolutely wanting, but that their connexion with the parietes is still more intimate.

These cords may be supposed to consist either solely of the vessels through which the ovulum is fœcundated, or to contain also the remains or indications of a system of nourishing vessels, or chordæ pistillares, the position of which points out the true nature of the ovarium in this class, or the relation it has to the apparently less simple ovarium of other families. I am inclined to adopt the latter supposition. In order, however, to be understood on this subject, it is necessary to premise that I consider the pistillum or female organ of all phænogamous plants to be formed on the same plan, of which a polyspermous legumen or folliculus whose seeds are disposed in a double series may be taken as the type. A circular series of these pistilla, disposed round an imaginary axis, and whose number corresponds with

that of the parts of the calyx or corolla, enters into my notion of a flower complete in all its parts.

But from this type and number of pistilla many deviations take place, arising either from the abstraction of part of the complete series of organs, from their confluence, or from both these causes united; with consequent abortions and obliterations of parts in almost every degree. According to this hypothesis, the ovarium of a syngenesious plant is composed of two confluent ovaria; a structure which is in some degree indicated externally by the division of the style, and internally by the two cords which I consider as occupying the place of two parietal placentæ, each of these being made up of two confluent chordulæ, belonging to different parts of the compound organ. I am well aware how very paradoxical such an hypothesis must seem, especially when applied to a structure apparently so simple as that of the ovarium of Compositæ; and I therefore regret that I am not yet fully prepared to bring forward in its support a series of facts already in my possession, consisting of deviations from the usual structure of organs, and particularly of instances of stamina changed into pistilla.

In the mean time it may give some plausibility to the hypothesis to remark, that there are families of plants strictly natural in which a series of degradations exist, if I may so speak, from the assumed perfect pistillum, to a structure as simple as that of Compositæ.

Thus in *Proteaceæ* we have the type of the perfect pistillum in the many-seeded folliculus of *Embothrium*; the first degree of imperfection in that of *Grevillea*, where only one ovulum of each series remains; a further reduction in the indehiscent monospermous fruit of *Leucospermum*, in which the insertion of the ovulum is lateral; and the simplest form in *Protea* itself, where the

the single ovulum is inserted at the base of the cavity. Proteaceæ, however, exhibit a series of obliterations in the parts of a single pistillum only. An illustration more in point, though somewhat less perfect as a series, may be taken from *Goodenoviæ*, an order of plants very nearly related to the class of which we are treating. In the greater part of *Goodenoviæ*, the ovarium is bilocular, each cell having an indefinite number of seeds; in the greater number of *Scævolæ*, each cell is reduced to a single ovulum; while in some species of the same genus, and in all the species of *Dampiera*, the ovarium, though retaining its external characters, is reduced to a single monospermous cell, with an erect ovulum, as in Compositæ. The natural order *Cruciferæ* exhibits also obliterations, more obviously analogous to those assumed as taking place in syngenesious plants; namely from a bilocular ovarium with two polyspermous parietal placentæ, which is the usual structure of the order, to that of *Isatis*, where a single ovulum is pendulous from the apex of the unilocular ovarium. And lastly in the genus *Bocconia*, in the original species of which (*B. frutescens*) the insertion of the single erect ovulum has the same relation to its parietal placentæ, as that of Compositæ has to its filiform cords, a second species (*B. cordata*) exists in which these placentæ are polyspermous.

My *sixth* observation on Compositæ regards the order in which the florets expand. To understand the relation this order has to that of other families, it may be necessary first to make a few remarks on the more usual modes of inflorescence.

It is well known that in an absolutely simple spike the expansion of the flowers is ascendent; that is, begins at the base of the spike and proceeds regularly upwards. To this order very few real exceptions occur, several of the apparent deviations being connected with some degree of composition in the spike.

It is also known that in a compound spike, while the expansion of each partial spike is ascendent, that of the spikes, with relation to each other, is descendent; the terminal spike expanding first, and the others in a regular succession downwards. This order, indeed, admits of a greater number of exceptions than that of the simple spike; several of them apparently depending on the density or imperfect composition of the spike; and the more usual deviation consisting in the expansion beginning below the apex, and proceeding in opposite directions from the point of commencement; the upper portion following the order of the simple, the lower that of the compound spike *.

The simple racemus and corymbus are obviously very slight modifications of the spike, and in their expansion obey the same law.

A syngenesious compound flower, or *capitulum* as it may be termed, is merely a spike with a shortened and generally depressed axis. In cases where this capitulum is unquestionably simple, the expansion of its flowers is uniformly from circumference to centre, or in the order of the simple spike. Where the capitula are disposed in a corymbus, which is their usual mode of combination, the order of the compound spike is observed; their expansion with relation to each other being from centre to circumference. In their denser aggregations, whether forming a compound spike or head, the same order of expansion obtains, and it continues though the florets in each common calyx or involucrum should be lessened in number, or even reduced to unity, as in *Echinops* and *Rolandra*.

* The most remarkable exception to the order of the compound spike exists in the compound umbel of Umbelliferæ, of which the outer umbellulæ expand somewhat earlier than the central; and as this order of expansion seems to extend through the whole natural family, *Astrantia*, in which the terminating umbel expands much earlier than those of the lateral branches, cannot be considered as having a compound umbel.

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The absolute constancy in the order of expansion of the simple capitulum from circumference to centre, and the more or less complete inversion of this order in the compound capitulum, appear to afford tests of the real structure in certain cases where the degree of composition, and consequently the proper names of some of the parts, might otherwise be doubtful.

To illustrate this I select two genera, *Lagasca* and *Cæsulia*.

In *Lagasca* the capitulum, both from its form and the appearance of its involucrum, might at first sight be considered as simple: on examination, however, it is found to differ from all simple capitula, in each floret being furnished with a tubular envelope, exactly resembling a five-toothed perianthium, but which does not in any state cohere with the included ovarium.

Cavanilles, by whom the genus was established, regarded this envelope as a genuine perianthium, and erroneously described its tube as cohering with the ovarium; an error which is copied in Persoon's Synopsis Plantarum, where the genus is consequently placed in Polygamia æqualis. Jacquin, who has published *Lagasca* under the name of *Noccæa mollis* *, also describes the envelope of each flower as a proper perianthium, although aware of its tube being distinct from the ovarium. Subsequent writers have, indeed, more correctly referred the genus to Polygamia segregata; but the terms involucellum and calyculus, which they apply to the envelope in question, appear to me objectionable, for a reason that will presently be given.

Three suppositions may be formed respecting the nature of this envelope, namely, either that it is an involucrum reduced, as in *Echinops*, to a single flower; secondly, that it is a proper perianthium, which in appearance it very much resembles; or thirdly,

* Fragm. Bot. p. 58. tab. 85.

that

that it is more analogous to the outer calyx of *Scabiosa*, which M. Cassini seems to consider different in its nature from both these parts.

But the order of expansion in *Lagasca*, which is, though with some degree of irregularity, from centre to circumference, or that of the compound capitulum, seems to decide the question respecting the envelope of each flower, and to establish its identity with involucrum: nor does this involucrum differ materially from that of *Echinops*, except in the reduced number and confluence of its component parts.

The real structure of *Cæsulia* is perhaps less obvious.

This genus, which was first published by Dr. Roxburgh*, is referred by him to Polygamia segregata; the tubular envelope or involucrum of each floret being described as distinct from the included ovarium.

Kœnig, on the other hand, by whom the genus was discovered, and whose account of it is given in the same work, describes the partial involucrum of Roxburgh as the surface of the ovarium itself; its segments being, according to him, a pappus of two leaves. And lastly Willdenow, regarding this involucrum as merely paleæ of the receptacle, refers the genus to Polygamia æqualis; in which order it is continued, both in Persoon's Synopsis, and in the second edition of Mr. Aiton's Hortus Kewensis.

This last view of the structure seems the most erroneous of any, and was probably adopted by Willdenow, in consequence of his having added to the genus a second species not really belonging to it, and which I shall have occasion to notice in another part of my subject.

An examination of the parts of fructification in different stages

* In Corom. Plants, i. p. 64. t. 93.

reconciles

reconciles the opposite statements of Kœnig and Roxburgh; for I find that at the time of flowering the envelope of each floret is, as Roxburgh has figured it, distinct from the ovarium, with which, however, in a more advanced stage its tube becomes firmly united; a fact that sufficiently accounts for Kœnig's description.

There is here, therefore, a nearer approach to a true perianthium than in the involucrum of *Lagasca;* but the expansion of the flowers being, as in that genus, from centre to circumference of the capitulum, I consider the envelope of *Cæsulia* as unquestionably an involucrum, and the genus consequently belonging to Polygamia segregata.

I may here remark, that the name Polygamia segregata, invented by Linneus for those genera of Compositæ with densely aggregate capitula, is calculated to give an erroneous idea of the nature of the structure; the opposite term Polygamia congregata being, according to the view now taken, obviously more proper for those genera, at least, whose involucra contain several flowers. It is not unlikely, indeed, that Linneus himself was aware of the true nature of the inflorescence of these genera; but the term Polygamia congregata would not have suited the artificial arrangement which he adopted in his subdivisions of the class, nor his including in it the order *Monogamia*; for with this order the single flowered genera of Polygamia segregata must then have been confounded.

It is a curious circumstance, that the order of expansion in Compositæ does not depend on the number of flowers actually existing, but on the effort, if I may so term it, made to produce them, manifested by the presence of an involucrum or common calyx, which is in some cases reduced to a single flower. The fact at the same time contributes to prove, that the whole natural class is formed on that plan of dense aggregation of flowers, for

for which I have already attempted to show that certain parts of the structure of a syngenesious floret are peculiarly well adapted.

The circumstance, however, is not confined to Compositæ, but exists in an equally remarkable degree in *Gramineæ*.

I have formerly considered the gluma, or what Linneus has termed calyx, in this family of plants, as an involucrum.

In those genera where this gluma or involucrum contains several flowers their expansion is generally ascendent, or in the order of the simple spike. In a spike formed by these many-flowered glumæ, as that of *Triticum* and *Lolium*, the expansion of the partial spikes, with relation to each other, is descendent, or in the order of the compound spike; in most cases, however, with that deviation, which I have already noticed, of the expansion commencing below the apex and proceeding in opposite directions. But as the same descendent expansion takes place in a spike formed of single-flowered glumæ, it may be inferred that the genuine type or most perfect form of a grass is to have several flowers in its gluma or involucrum: a view not only consistent with the fact of a great majority of the order having actually this disposition; but also with that peculiarity in the vascular structure of the inner valve of the perianthium; which, whether it be considered as indicating that this part is formed of two confluent valves, an opinion I have elsewhere * advanced, or merely as a transposition of vessels in a simple valve, analogous to that in the syngenesious floret, is evidently adapted to the many-flowered spicula, though equally existing in that with a single flower.

The resemblance between the outer calyx of *Dipsaceæ* and the single-flowered involucrum of Compositæ is so striking, that it

* In General Remarks on the Botany of New Holland.

cannot

cannot appear very paradoxical to consider them as both of the same nature.

In Dipsaceæ, however, there is no instance of the outer calyx containing more than one flower, and the evidence afforded by inflorescence on this subject is not altogether satisfactory.

In *Dipsacus* it has been long noticed that expansion begins about the middle of the spike, and proceeds in opposite directions from the point of commencement: this order is evidently more analogous to that of the compound than of the simple spike; there being several instances of spikes manifestly compound, where the same inversion of the upper part exists.

But a fact, which I do not find any where observed, respecting the inflorescence of certain species of *Scabiosa*, particularly *succisa* and *atropurpurea*, is not so easily reconcilable with the compound spike: in these, and I have reason to think in many other species of the genus, the expansion begins simultaneously at the base and middle of the capitulum, proceeding regularly upwards from both points. Were this the case in all Scabiosæ, the compound nature of the spike in Dipsaceæ, although by no means proved, might be considered not improbable: there are, however, several species of the genus in which the order of expansion is altogether that of the simple spike.

Connected with the subject of inflorescence, I may remark that priority of development, whether among similar parts in the same flower or the different flowers of the same spike, is generally accompanied with greater perfection of these parts or flowers, and apparently with greater power of resisting the ordinary causes of abortion or obliteration.

I have formerly * observed respecting several natural families of plants, in which the stamina are in a determinate number, but a

* In Prodr. Flor. Nov. Holl. vol. i. and Appendix to Flinders's Voyage to Terra Australis.

number subject to reduction, that this reduction, where the flower is of a regular form, takes place in the same order in each natural family. Thus in *Junceæ*, which are generally hexandrous, the triandrous species have their stamina constantly placed opposite to the three outer leaves of the perianthium, while in Restiaceæ, Asphodeleæ, and I believe in a great part of the regular-flowered Liliaceæ, in certain species of which a similar reduction occurs, the stamina in the triandrous species are placed opposite to the inner leaves or segments of the perianthium. But in both cases the greater perfection of those stamina that exist in genera or species reduced to the smallest number, is indicated, where there is no reduction, by the earlier bursting of their antheræ; so that from this circumstance the order of reduction or abortion of stamina in any natural family may with some confidence be predicted by an examination of those genera where the number is complete.

Wherever the separation of sexes takes place, it may be assumed that the female flower is the more perfect production. And if this be admitted, where both sexes exist in the same simple spike the female should be found at its base, or where expansion commences, which is almost uniformly the case. For the same reason, in the trifid or trichotomous inflorescence, the female should be placed in the centre, which is also generally the fact*.

This connexion between præcocity and perfection of development is even more constant than the order of expansion in certain forms of inflorescence; as it is found to extend to several of the exceptions to this order.

Thus in the apparently simple spike of *Poterium*, where the order of expansion is descendent, the female flowers occupy the

* To this order the most remarkable exception occurs in *Begonia*, in which the male flowers are central, and expand long before the lateral female flowers.

upper

upper part of the spike; and this relation also exists in the more compound inflorescence of *Ricinus*, *Syphonia*, and *Celtis*, in which the order of expansion is equally inverted.

It may seem rather paradoxical to select *Euphorbia* as an example of the same relation; this genus being considered by Linneus, and the greater part of the botanists who have adopted his system, as having a dodecandrous hermaphrodite flower. We have already, however, I believe, sufficient evidence that this supposed hermaphrodite flower is in reality formed of several monandrous male flowers surrounding a single female *.

In conformity with this view of its composition, and with the relation above attempted to be established, the development of the pistillum precedes that of the stamina in many species of the genus.

It is more difficult to determine whether this order of expansion and relative position of sexes in *Euphorbia* be in conformity with the general rule, or an exception to it. For its faciculus of flowers may be considered as analogous either to the simple spike, and consequently having an inverted order of expansion, as in *Allium descendens*, and certain species of *Grevillea* and *Anadenia*: or it may be assimilated to the compound spike, as in several species of the genus the male flowers appear to be separated into fasciculi;

* To the arguments I have adduced (in my Remarks on the Botany of New Holland) in support of this opinion, I am now enabled to add the more direct proof derived from certain species of *Euphorbia* itself, in which the female flower is furnished with a manifest calyx. I have formerly observed, that in a few cases the footstalk of the ovarium is dilated and obscurely lobed at top: but in the species now referred to it terminates in three distinct and equal lobes of considerable length, and which being regularly opposite to the cells of the capsule may be compared to the three outer foliola of the perianthium of *Phyllanthus*, between which and the cells of the capsule the same relation exists. This calyx is most remarkable in an undescribed species of *Euphorbia* from the coast of Patagonia, in the Herbarium of Sir Joseph Banks; but it is observable, though less distinct, in *E. punicea* and several other species.

and according to this view the order of expansion is direct, the central female flower being the representative of the terminal partial spike.

There is even a third species of inflorescence with which the fasciculus of *Euphorbia* may be compared, namely, that consisting of one or more verticilli with a single flower in the centre. In this, which may be considered a modification of the spike or umbel, the usual order of expansion seems to be from centre to circumference. Its simplest form occurs in an unpublished New Holland genus of the same natural family with *Euphorbia*, in which a single verticillus of male flowers surrounds the central female flower. *Lambertia* may be considered as another instance of the same mode, and as far as can be determined, in a case where the flowers are hermaphrodite and their expansion nearly synchronous, following the same order. In all the known species of this genus the leaves are verticillate, and uniformly in threes: in *L. formosa* and *inermis* the involucrum constantly contains seven flowers, while in *L. uniflora* it is reduced to one flower. The seven flowers of the two former species I consider as made up of two verticilli, in number of flowers corresponding with that of the leaves, and of a single central or terminal flower; to which terminal flower *L. uniflora* appears to be reduced. From this order of reduction it may be assumed as more probable that species of *Lambertia* should be found with ten or four flowers in the involucrum than with nine, six, or three. But greater permanence being, as has been already remarked, generally connected with greater perfection, it becomes also probable that, if any species of this genus should be discovered with androgynous capitula, the female flower will occupy the centre as in the genus of Euphorbiaceæ above referred to.

It is worthy of remark, and may indeed appear in some degree

at

at variance with the foregoing observations, that although in an assemblage of flowers priority of expansion generally indicates a greater degree of perfection, and consequently a more ready convertibility of the hermaphrodite into the female flower; yet in a hermaphrodite flower the development of stamina usually precedes that of pistilla. The most remarkable exceptions to this order of development which I at present remember, occur in several species of *Plantago*, where the stigmata are fully developed, and often even withered, before the bursting of the antheræ.

I now proceed to make some remarks on certain genera of Compositæ which either occur under different names in late systematic works, or whose structure and limits seem to be imperfectly understood.

Soliva

was established in the Prodromus Floræ Peruvianæ et Chilensis, and is adopted by Persoon in his Synopsis Plantarum.

To this genus *Hippia minuta* of the Linnean Herbarium unquestionably belongs, and it is perhaps not specifically distinct from *Soliva pedicellata*. But on comparing the structure of this plant with the figures and descriptions, given by Mons. de Jussieu (in the fourth volume of the Annales du Museum,) of the different species of his *Gymnostyles*, it appears to me evident that the whole of this genus is referable to *Soliva*, whose principal characters would consist in the want of corolla or perhaps its accretion with the persistent style in the female florets; in the pericarpia being more or less winged, and presenting their disk instead of their margins to the centre of the capitulum.

Sir

Sir James Smith has already pointed out the error M. de Jussieu has been led into in referring *Hippia minuta* Linn. to his *Gymnostyles nasturtiifolia*, a plant much more nearly related to *Hippia stolonifera* of Brotero; which, from repeated examination, I can with confidence refer to the same genus.

Gymnostyles anthemifolia is stated by M. de Jussieu to be a native of New South Wales: but as I have observed it only in cultivated ground in the neighbourhood of Sydney, and as it has certainly been found in South America, of which four other species of the genus are unquestionably natives, it has probably been imported into New South Wales, perhaps from Brazil; nor is it altogether improbable that *Hippia stolonifera* of Brotero may have been introduced into Portugal from the same quarter.

Grindelia,

described by Willdenow in the Transactions of the Natural History Society of Berlin for 1807, and subsequently in his Enumeratio Plantarum Horti Berolinensis, flowered in Kew Gardens for the first time in 1815, when I had an opportunity of examining it, and of determining its very near affinity with *Donia*, a genus proposed in the second edition of Hortus Kewensis, and adopted by Mr. Pursh in his Flora of North America: the principal distinction between these two genera consisting in a difference in the number of radii of the pappus, which in *Grindelia* is described by Willdenow as of two rays, and according to my observations has more frequently one only. But as even in *Donia* the number of rays, though indefinite, is variable, and the structure of the pappus is very nearly similar in both genera, which in all other respects agree, it may be perhaps expedient to unite them under the name of *Grindelia*, which was first in order of publication.

Tridax

Tridax

was first established by Linneus, in Hortus Cliffortianus, from a specimen found at Vera Cruz by Houston, and sent to Clifford by Miller. As Linneus had no specimen in his own collection, that in Clifford's Herbarium, now in the possession of Sir Joseph Banks, is the only authority for the genus; and on examining this specimen I find the pappus to be not setaceous, as Linneus has described it, but distinctly plumose. There is, therefore, no difference whatever between *Tridax* and *Balbisia* of Willdenow; and on comparing *Tridax procumbens* with *Balbisia elongata*, I cannot satisfy myself that they are even specifically distinct.

Angianthus.

Angianthus tomentosus of Wendland's Collectio Plantarum, (vol. ii. p. 32. tab. 48.) published in 1809, is evidently the same plant as my *Cassinia aurea*, described in the fifth volume of the second edition of Hortus Kewensis, which did not appear till 1813. Wendland neither mentions the native country of his *Angianthus*, nor from whence he received it. He must, no doubt, however, have obtained it from Kew Garden, where it was introduced and flowered from seeds which I collected in 1802, in the island of St. Francis, on the South coast of New Holland.

Meyera.

This genus, described by Schreber in his edition of the Genera Plantarum, is not adopted by Willdenow. Swartz, however, in his Flora Indiæ Occidentalis, has referred to it, and I have no doubt correctly, *Eclipta sessilis* of his Prodromus. On comparing this species of *Meyera* with a plant in Sir Joseph Banks's Herbarium, collected in Peru by Dombey, and which exactly agrees with

Sobreya

Sobreya of the Flora Peruviana, it appears evident that this genus is reducible to *Meyera*. *Enhydra* of Loureiro's Flora cochinchinensis, though described somewhat differently, and referred to Polygamia segregata, I have little doubt, belongs to the same genus; as does unquestionably *Hingstha* of Roxburgh's unpublished Flora Indica, where it is also referred to Polygamia segregata. This plant, which I have examined, is scarcely distinct from a species of *Meyera* that grows in New South Wales.

Cryphiospermum of Mons. de Beauvois's interesting Flore d'Oware et Benin, although reduced by him to Cichoraceæ, I have but little hesitation in referring also to *Meyera*. And lastly, *Cæsulia radicans* of Willdenow, likewise a native of æquinoctial Africa, is perhaps not specifically different from *Cryphiospermum repens* of Mons. de Beauvois.

Melampodium

was established by Linneus, in the first edition of Genera Plantarum and in Hortus Cliffortianus, from a specimen found by Houston near Vera Cruz, and communicated by Miller to Clifford, in whose Herbarium, now forming part of the collection of Sir Joseph Banks, it still exists. It does not appear that this plant has been found by any other botanist than Houston; and according to the character given by Linneus of *Melampodium*, it must be considered the only species of the genus.

In the second edition of Species Plantarum he added to it, but with a doubt, *Melampodium australe*, a plant adopted from Lœfling, according to whose description the pappus and surface of the seed are widely different from those of the original species. Swartz has referred to the genus a third species, *M. humile*, entirely distinct in these respects from both the former; and more recently a fourth species, *M. longifolium*, with seeds differently modified from all the others, has been annexed to it.

But

But if these four plants, so extremely different from each other in pappus and form of the pericarpium, really belong to the same genus, as their habit seems strongly to indicate, there can be no reason to separate from them *Alcina* of Cavanilles, erroneously considered by Willdenow as a species of *Wedelia*: and *Dysodium* of Richard, published in Persoon's Synopsis, though differing from all the others in the form of its pericarpium and in that of its receptacle, must also be reduced to this genus. If, however, the part described by Linneus as pappus in *Melampodium americanum* be really such, and if the pericarpium itself vary so widely both in form and surface, it would be inconsistent with the principles of division generally adopted in Compositæ, to unite all these plants into one genus, notwithstanding their great resemblance in habit as well as in the other parts of fructification; and it would be at least in vain to look for any combining character in this part of their structure.

A careful examination of the female flowers, especially in an early stage, removes this difficulty, by proving that the supposed external coat of the ovarium, with its various inequalities of surface, some of which have been described as pappus, is in reality an involute bractea or foliolum of the involucrum, like that of *Micropus*, completely inclosing the ovarium, but from which in several species of the genus it is entirely, and in others in great part, distinct.

Craspedia

first appears in Forster's Prodromus Florulæ Insularum Australium, where an essential generic character is given, but no description of the species. The genus is adopted and the character received without remark by Willdenow in his edition of Species Plantarum, and by Persoon in his Synopsis. Among George Forster's drawings of subjects of natural history made in

Cook's second voyage, and now in the library of Sir Joseph Banks, there is a figure of this plant, from which it appears that he originally referred it to *Stæhelina;* a proof that he had not at that time very carefully examined it. It is not improbable therefore that he afterwards proposed it as a distinct genus, belonging to Polygamia segregata, from finding that this had been already done by Solander, whose name (*Cartodium*), however, he did not think it necessary to adopt, and with whose generic character he probably was not acquainted. In his own he very erroneously states that there is no partial involucrum, and hence perhaps M. Labillardiere entirely overlooked *Craspedia* when he established his *Richea* from a nearly related species of the same genus. That such is the case I have long since briefly noticed*, and have ascertained by a comparison of the specimen of *Craspedia uniflora* in George Forster's Herbarium with *Richea glauca* of Labillardiere, and other species of the same genus which I have observed in New Holland.

M. Labillardiere's character of *Richea* is essentially correct. It is well to remark, however, that his general involucrum is formed of the bracteæ subtending and in equal number with the outer partial capitula; and that the general receptacle has no other paleæ than the analogous bracteæ of the inner capitula. It is the more necessary to take this view of the structure, as I have found in New Holland a nearly related genus (*Calocephalus*), which differs from *Craspedia* and *Richea* in the want of these bracteæ, as well as in the partial receptacles being without paleæ, and in the rays of the pappus being plumose only in the upper part. I have also another genus of this tribe (*Leucophyta*) from the same country, differing from *Calocephalus* in having a general involucrum consisting of a few short bracteæ, in the squamæ of its partial involucra being concave and bearded at top, and in the rays

* In Prodr. Flor. Nov. Holl. p. 555.

of

of its pappus being plumose through their whole length, as in *Craspedia*, from which it is distinguished by the want of paleæ on the partial receptacles, and very remarkably in habit.

I have selected the foregoing genera as having been either published under different names, or, as it appears to me, unnecessarily subdivided. In this extensive class it would not be difficult to point out a much greater number consisting of species improperly united. One very remarkable case of this kind is the genus

CALEA,

to which, as I intend to enter fully into the history and affinities of its species, I shall confine myself.

This genus was established by Linneus in the sixth edition of his Genera Plantarum, where the natural character is given: but the following essential character, which is still retained, appears for the first time in the twelfth edition of Systema Naturæ, in the third section of Polygamia æqualis:

"*Receptaculum* paleaceum, *Pappus* pilosus, *Calyx* imbricatus."

The species originally referred to *Calea*, in the second edition of Species Plantarum, are *C. jamaicensis*, *oppositifolia*, and *Amellus*, described from specimens in Browne's Jamaica Herbarium, which he had received a few years before, and incorporated with his own.

These three plants Linneus had originally referred to *Santolina**, for which it seems to me rather less difficult to account than for his afterwards uniting them together to form his genus *Calea*; two of them, according to his descriptions†, though in reality one only, being without pappus, and in other respects corresponding with the generic character of *Santolina*; and the third, which

* In Amœnit. Acad. vol. v. p. 404. † *Loc. cit.*

Browne had doubtfully referred to the same genus, though furnished with pappus, agreeing with the others in having opposite leaves.

But the difference in habit between all these plants and the original species of *Santolina* is so great, that it probably afterwards determined Linneus to remove them from that genus; and although he found a sufficient generic character in the pappus of *Calea jamaicensis* only, he united with it the two other species, for a reason perhaps similar to what I have supposed led him to separate all the three from *Santolina*. It is remarkable, however, that not one of these three original species of *Calea* corresponds with his character of the genus; and that they in reality belong to three very distinct genera, on principles which, I conceive, Linneus himself would have admitted.

The *first* species, *Calea jamaicensis*, is the only one that even seems to agree with the generic character, in having pappus which at first sight (to the naked eye at least) might appear simply capillary, but which on a closer examination proves to be of a very different and nearly peculiar structure. Of this species I have seen only one authentic specimen, received from Browne by Ehret, and now in Sir Joseph Banks's Herbarium. The specimen in question, though incomplete, evidently belongs to the same species with "Conyza fruticosa cisti odore, floribus pallide purpureis, summitatibus ramulorum insidentibus," of Sloane*, of which I have examined the original very perfect specimens in his Herbarium, preserved in the British Museum†, and am satisfied that its pappus is of the same structure as that of *Calea cordifolia* of Swartz, who has well described it, but who has at the same time given a different account of that of *C. jamaicensis*‡. These

* Hist. Jam. i. p. 257. tab. 151. fig. 3.

† Herb. vol. v. fol. 14 & 15.

‡ In Flor. Ind. Occid. vol. iii. p. 1328.

two

two plants are the only published species of this genus, for which the name of *Calea* should be retained, and which may be distinguished by the following characters:

Calea.

Caleæ species *Linnei.*

*Involucrum** imbricatum. *Receptaculum* paleaceum. *Flosculi* tubulosi, uniformes, hermaphroditi. *Antheræ* basi muticæ. *Stigmata* acuta. *Pappus* paleaceus: radiis uninerviis, pinnatifido-striatis.

Frutices (Americæ æquinoctialis,) *pubescentes, scabri.* Folia *opposita, indivisa.* Capitula† *corymbosa, v. terminalia, v. axillaria.* Involucri *subovati foliola nervosa, obtusa.* Paleæ *receptaculi convexi distinctæ, figura et textura fere involucri.* Corollæ *luteo-purpureæ* (Swartz), *glabræ, laciniis dinerviis.* Achenium *subcylindraceum v. obsolete angulatum, glabrum v. pubescens, callo baseos subobliquo.* Pappus *persistens albus, nitens; radiis simplici serie subulatis, indivisis, superne denticulatis.*

Obs. In Sir Joseph Banks's Herbarium there are two plants very nearly related to *Calea*, differing from it merely in having a radius of ligular female florets. If this difference be considered sufficient to constitute a genus, it may be named *Caleacte.* The first of these plants (*C. urticifolia*), with nearly ovate acute crenated leaves, found by Houston near Vera Cruz, is *Solidago urticæfolia* of Miller, by whom it appears to have been cultivated. The second, with deeply lobed or pinnatifid leaves (*C. pinnatifida*), was lately sent from Brazil by Mr. Sellow.

The *second* Linnean species, *Calea oppositifolia*, has very little affinity to the first. In attending merely to the technical character of *Santolina*, it might be referred to that genus; but it dif-

* Calyx communis *Linnei.*

† Corolla communis *Linn.*

fers

fers so widely, both in other points of structure and in habit, that there can be no question of the propriety of separating it, which may be done by the following character, and under the name of

Isocarpha.

Receptaculum conicum: *paleis* distinctis, conformibus: extimis *involucrum* constituentibus. *Flosculi* tubulosi, uniformes, hermaphroditi. *Antheræ* basi muticæ. *Stigmata* appendice elongato, hispidulo, acuto. *Achenium* prismaticum: *pappo* nullo.

Herbæ (Americæ æquinoctialis). Folia *opposita* (*vel alterna*) *indivisa*. Capitula *ovata*, *terminalia*, *terna* (*vel solitaria*). Paleæ *lanceolatæ*. Corollæ *albidæ*. Antheræ *basi truncatæ*.

Obs. I have so constructed the generic character of *Isocarpha* as to include *Spilanthus atriplicifolius* of Linneus, which, however, differs very remarkably from *Calea oppositifolia* in having alternate leaves and solitary capitula, as well as in the texture and form of its paleæ.

The pappus, consisting of three or four very minute aristæ, described by Swartz* in *Calea oppositifolia*, I have not been able to observe in any of the specimens that I have examined.

The *third* species, *Calea Amellus*, is probably the same plant as *Bidens scandens*, which Linneus described in Hortus Cliffortianus, but, having no specimen in his own collection, appears to have forgotten. The original specimen in Clifford's Herbarium, now in the possession of Sir Joseph Banks, evidently belongs to the same species, and perhaps to the same individual, with a specimen in Miller's collection, which Mr. Dryander compared, and considered to agree with *Calea Amellus* of the Linnean Herbarium. The true synonym, therefore, of *Calea Amellus* is "*Bidens* suffruti-

* In Obs. Bot. p. 302.

cosus

cosus vimineus, foliis oblongo-ovatis oppositis, floribus comosis" of Browne* ; while Linneus has quoted and even derived his specific name from the same author's "*Amellus* ramosus, foliis remotis terminalibus, fulcris longis divaricatis†;" which, instead of belonging to *Bidens scandens*, I believe, for the following reasons, to be *Bidens nivea*. 1st, The figure in Burmann's Thesaurus Zeylanicus‡, quoted by Browne for his plant, though belonging to *Lavenia erecta*, is at the same time a good representation of *Bidens nivea*, and very unlike *Bidens scandens*. 2dly, Browne's description in most respects very well agrees with the former species, but certainly not with *Bidens scandens*. And 3dly, I infer that *Bidens nivea* was actually in Browne's Herbarium, from finding it in the Flora Jamaicensis published in the 5th volume of Amœnitates Academicæ, and formed chiefly from that Herbarium ; though a very erroneous reference for this species is there made to Browne's first *Santolina*, which, from the description, cannot possibly belong to *Bidens nivea*, but is probably *Verbesina gigantea*.

M. Decandolle has lately established a new genus, *Salmea*, consisting of *Bidens scandens*, *Bidens hirsuta*, and a third species which I have not examined. These plants are very properly separated from *Bidens* by this excellent botanist, and well distinguished both from that genus and from *Melananthera*. It is rather remarkable, however, that he has not thought it necessary to compare *Salmea* with *Spilanthus*, from which, according to his description, it differs only in its imbricate involucrum. But as in *Spilanthus* the foliola of the involucrum are not exactly equal, and are disposed at least in a double series, I have introduced

* Browne, Jam. 317. † *l. c.*

‡ Eupatoriophalacrum scrophulariæ aquaticæ foliis oppositis, *Burm. Thesaur. Zeyl.* p. 95. t. 42.

troduced some additional distinctions into the following character of

Salmea.

Decandolle in Cat. Hort. Monspel. p. 140.

Involucrum imbricatum. *Receptaculum* conicum, *paleis* persistentibus. *Flosculi* tubulosi, uniformes, hermaphroditi (5-fidi). *Antheræ* sagittatæ. *Achenium* verticaliter compressum, bi-aristatum; *aristis* persistentibus (apteris v. alatis).

Frutices (Americæ æquinoctialis) *sæpius decumbentes.* Folia *opposita, indivisa.* Inflorescentia *terminalis, subpaniculata, vel corymbosa.* Corollæ *albidæ.* Paleæ *receptaculi post lapsum pericarpiorum persistentes.*

Obs. Of this genus I have examined specimens of three species in Sir Joseph Banks's Herbarium, differing from each other in several very remarkable characters.

1. *Salmea scandens*, (Decand. l. c.) in which the aristæ are equal and without any membranaceous border: stigmata remarkably dilated, tongue-shaped, obtuse, not hispid, obscurely papulose, and apparently without any terminal appendix: style dilated at the base into a hemispherical bulb which is truncated underneath.

2. *Salmea hirsuta*, (Decand. l. c.) whose aristæ are unequal; the inner, which is the larger, being furnished with an evident ala; the outer having a narrow margin only: stigmata sharp and spreading: style dilated into an ovate bulb which has an attenuated base.

3. *Salmea? curviflora* (nob.) differs from both the preceding in the tube of its corolla being remarkably bent outwards. In place of the inner arista there is a broad obtuse wing, of which the inner margin is straight and thickened, the outer continued down nearly to the base of the pericarpium: the outer arista is winged:

and

and besides these, one or two minute processes are generally observable. Stigmata revolute*.

In the 12th edition of Systema Naturæ, Linneus added to his genus *Calea* a *fourth* species, namely *Calea scoparia;* for what reason it would be difficult to discover, as it does not resemble, either

* In the remarkable character of its re-curved florets, as well as in some other respects, this species of *Salmea* agrees with *Spilanthus arboreus* of George Forster (in Commentat. Gotting. ix. p. 66.), of which he originally formed his genus *Laxmannia*; from a very erroneous view of its structure, however, having described the Nectarium or glandula epigyna as a "germen superum;" the real, though imperfect, germen with its two aristæ as a "perianthium bidentatum," and consequently referring the genus to Polygamia segregata.

When he afterwards corrected these errors and reduced *Laxmannia* to *Spilanthus*, he did not discover that he had only the imperfect hermaphrodite or male plant before him.

That *Spilanthus arboreus* is really diœcious, I have ascertained from the examination of numerous specimens collected by Sir Joseph Banks in the Island of St. Helena, where it forms a small tree called by the inhabitants White-wood. It is *Bidens arborea* and perhaps also *Spilanthus tetrandrus* of Dr. Roxburgh's List of Plants appended to General Beatson's Tracts on St. Helena; the former being probably the female, the latter as tarved variety of the male plant.

In re-establishing *Spilanthus arboreus* as a genus, sufficiently distinct from *Bidens*, *Spilanthus*, and *Salmea*, it will not, I conclude, be considered expedient to recur to Forster's name *Laxmannia*, which as far as relates to this plant is connected only with a series of blunders, was abandoned by the author himself, and has since been applied to another genus already generally adopted. It may be distinguished by the following character, and named

PETROBIUM.

Involucrum polyphyllum subduplici serie: exteriore breviore, foliolis paucioribus. *Receptaculum* paleaceum, planiusculum. *Flosculi* dioici, tubulosi, 4-fidi: *Masculi:* Antheris exsertis; Stigmatibus acutis hispidulis: *Feminei:* Staminibus sterilibus; Stigmatibus acutis recurvis. *Achenium* v. parallelo compressum v. angulatum; angulis (2-3) aristatis: *aristis* persistentibus, antrorsum denticulatis.

Arbor (Insulæ Stæ Helenæ). Folia *opposita*, *indivisa*. Panicula *terminalis*, *brachiata*. Involucrum *oblongum*. Paleæ receptaculi *squamis involucri subsimiles*. Corollulæ *ochroleucæ*, *tubo arcuato-recurvo* (*ut capitulum primo intuitu radiatum videatur*). Mas. Antheris *nigricantibus*, *basi emarginatis*, *appendice apicis brevissimo*, *acuto*; *loculis vestigio septi longitudinalis instructis*. Fem. Staminibus *sterilibus distinctis*, *antheris sagittatis cassis*.

in its fructification or habit, any of the three genera of which, as has been shown, *Calea* was originally composed. This fourth species, which he had at first referred to *Chrysocoma**, is now known to be diœcious;—Browne, by whom it was first described and figured, and one of whose specimens I have examined, Linneus, and even Swartz when he published his Observationes Botanicæ, being acquainted with the male plant only; which, however, all of them considered hermaphrodite: nor is there any reason to doubt that Gærtner's genus *Sergilus* is also the male of this species; although he has ventured to describe the colour of the embryo, deceived, probably, by the size of the imperfect ovarium, and the colour of its inner surface.

Professor Swartz has since given a more satisfactory account of *Calea scoparia*, and has referred it to *Baccharis*†; to which genus as Richard‡ and Jussieu§ have proposed to limit it, namely to the diœcious species of America, it unquestionably belongs. This limitation of *Baccharis* it may, upon the whole, be expedient to adopt; by doing so, however, a name of Dioscorides is applied to a genus of plants found only in the new continent; while, notwithstanding the contrary opinion is expressed by M. de Jussieu‖, sufficient distinctions exist between those species of *Baccharis* from which the Linnean character was taken, and *Conyza* when reduced to its original species, *C. squarrosa* and *bifrons*, and a few others since added to the genus: for these differ from *Inula* chiefly in the extreme shortness of their ligulæ.

As no satisfactory character has hitherto been given of *Baccharis*, that will serve to distinguish it, as now limited, from the diœcious *Gnaphalia*, I propose the following.

* Amœn. Acad. v. p. 404. et Syst. Nat. ed. 10. vol. ii. p. 1206.
† Flor. Ind. Occident. iii. p. 1339.
‡ Mich. Flor. Bor-amer. ii. p. 125.
§ Annal. du Mus. d'Hist. Natur. vii. p. 385.
‖ l. c.

Bac-

BACCHARIS.

(Richard) in Michaux Amer. ii. *p.*125. *Jussieu in Annal. du Mus. d'Hist. Nat.* vii. *p.* 385. Molina *Ruiz et Pavon Prodr. Flor. Peruv.* 111. Baccharidis species *Linn.*

Involucrum imbricatum. *Receptaculum* nudum. *Flosculi* tubulosi, dioici. *Masculi: antheris* exsertis, basi muticis; *stigmatibus* appendice acuto hispidulo; *pappo* subpenicillato. *Feminei* filiformes; *pappo* capillari.

Frutices (Americæ æquinoctialis et temperatæ). Folia *alterna, raro opposita, in quibusdam minuta vel nulla, ramis tunc foliaceo-alatis.* Inflorescentia *terminalis rariusve lateralis, corymbosa, nunc fasciculata.* Involucri *subovati v. oblongi squamæ semiscariosæ, margine simplici.* Mas. *pappo cinereo.* Fem. *limbo minuto 2-3dentato, staminibus sterilibus nullis: pappo elongato*.*

Willdenow, in his edition of Species Plantarum, has retained the four Linnean species of *Calea*, and added to them an equal number, not one of which belongs to any of the genera formed by the original species, but to four others equally distinct.

The *first* of these additional species, taking them in the order in which Willdenow has arranged them, is *Calea aspera*, which he adopted from Jacquin; by whom it is well described and figured, though erroneously referred to *Calea*.

* I have observed another dicœcious genus with naked receptacle, capillary pappus, and a habit nearly similar to that of *Baccharis*, of which *Baccharis nereifolia* Linn. is the only published species. It may be named

BRACHYLÆNA.

Involucrum imbricatum, squamis coriaceis. *Receptaculum* nudum. *Flosculi* dioici. *Masculi: antheris* exsertis, basi bisetis. *Feminei* angustiores, limbo 5-fido; *filamentis* sterilibus: *stigmatibus* linguiformibus imberbibus. *Pappus* utriusque sexûs pilosus scaber.

Arbusculæ *vel* Frutices (Africæ australis) *subtomentosi.* Folia *alterna integerrima vel dentata.* Inflorescentia *terminalis, subracemosa.* Involucra *subovata, brevia: squamis ovatis, textura uniformi.*

This, and not (as M. Richard has supposed) the nearly related species of North America, is what Linneus originally intended by his *Bidens nivea*, as appears by the specimen in his Herbarium; by his original reference to Vaillant's "Ceratocephalus foliis cordatis s. triangularibus flore albo*," described from a specimen in Surian's Herbarium; and by his afterwards adding as varieties of his species the two plants from Carolina figured in Hortus Elthamensis.

Calea aspera is abundantly distinct from *Bidens*, and has very little affinity with any of the original species of *Calea*, and least of all with *C. jamaicensis*, from which the character was taken. Since its appearance in Willdenow's work, however, it has been continued in this genus, in most of the recent catalogues of Gardens, as those of Desfontaines, Decandolle, and the second edition of Mr. Aiton's Hortus Kewensis; and Lamarck in his Illustrationes Generum has copied Jacquin's figure of it, apparently as the principal example of the genus *Calea*.

It is certainly now too late to recur to the name of *Amellus*, under which Browne, as I have already attempted to prove, first proposed this plant as a distinct genus; Linneus having soon after given that generic name to two very different plants, to one of which it is still applied; and the real plant of Browne having till now been mistaken, owing in part to his having entirely overlooked the pappus which is deciduous.

Bidens nivea, however, as long ago as 1784 was described by Von Rohr, and published by him in 1792 in the second volume of the Transactions of the Natural History Society of Copenhagen, as a distinct genus, under the name of *Melanthera*: and in 1803 by Richard, in Michaux's Flora Boreali-Americana, where it is called *Melananthera*, and where the two species included by Linneus

* Act. Paris. 1720, p. 327.

in

in his *Bidens nivea* are for the first time distinguished: and lastly this genus, as named and determined in the work of Michaux, is adopted by Persoon in his Synopsis.

But as both Von Rohr and Richard have given only the natural character of the genus, and the essential character proposed by Persoon is not altogether satisfactory, I have added the following, and adopted the more generally received name of

Melananthera.

(Richard) in Michaux Amer. ii. *p.* 106. Melanthera *Von Rohr in Kiobenh. Naturhist. Selskab. bind.* ii. *hefte* 1. *p.* 213. Amellus *Browne Jam.* 317. Bidentis species *Linn.* Caleæ species *Jacquin.*

Involucrum duplici serie polyphyllum, subæquale. *Receptaculum* paleaceum, convexum, paleis foliaceis. *Flosculi* tubulosi, uniformes, hermaphroditi. *Achenium* turbinatum angulatum vertice depresso. *Pappus* e setis (2—18) scabris, distinctis, deciduis. Herbæ (Americæ æquinoctialis et temperatæ) *pubescentes, scabræ.* Folia *opposita, indivisa v. sublobata.* Capitula *terminalia, pedunculis unifloris, elongatis, ternatis, geminisve.* Involucrum *foliaceum.* Receptaculi *hemisphærici* paleæ *foliolis involucri subsimiles.* Corollæ *albidæ.* Antheræ *nigricantes, appendicibus apicis albidis, basi muticæ; paulo post expansionem corollæ exsertæ, dein (contractione filamentorum) fauce inclusæ.* Stigmata *appendice acuto hispidulo, post retractionem tubi antherarum exserta; demum subinclusa*.*

Obs. In Von Rohr's natural character of *Melanthera* the Nectarium, or glandular body sheathing the base of the style, is introduced,

* In the extensive collection of plants made by my lamented friend Dr. Smith, on the banks of the Congo, I have observed a Syngenesious genus, which, though belonging to Polygamia superflua and having yellow flowers, is in other respects so nearly related to *Melananthera*, that had it been found with ripe seeds only, it would certainly have been referred

duced, which is the earliest notice I have yet found of this organ in Compositæ, except in Batsch's Analysis Florum, published in 1790, where it is both described and figured in *Coreopsis tripteris*. The merit, however, of establishing its nearly universal existence in the hermaphrodite florets of this extensive class belongs to M. Cassini.

Both Von Rohr and Richard in their characters of *Melanantheræ* have described the antheræ as shorter than the corolla, which is indeed the case in a particular state of the flower; immediately after its expansion, however, they project considerably, and again become inclosed in the more advanced stage. This fact has been noticed by Jacquin*, who considers the final inclosure of the antheræ to be owing to the elongation of the corolla. But the actual increase in length of the corolla is very slight, and by no means sufficient to account for the appearance; the real cause of which is a considerable, and I believe a gradual, contraction of the filaments. This œconomy is not unfrequent

referred to it. The following characters, however, prove it to be sufficiently distinct. It may be named

Lipotriche.

Involucrum duplici serie imbricatum, subæquale. *Receptaculum* convexum, *paleis* foliaceis, distinctis. *Capitulum* radiatum. *Ligulæ* (simplici serie) femineæ. *Flosculi* hermaphroditi, *stigmatibus* appendice acuto hispidulo. *Achenia* subuniformia, turbinata; *Pappo* setaceo, caduco.

Herbæ (Africæ æquinoctialis) Folia *opposita, indivisa.* Pedunculi *terminales, terni.* Involucra *brevia, foliacea.* Paleæ receptaculi *carinatæ, nervosæ, acutæ.* Corollulæ *flavæ.* Ligulæ *elongatæ,* 3-*dentatæ.* Antheræ *nigricantes, subinclusæ, basi muticæ.* Achenium *obtusè tetragonum.* Pappus, *in disco verticis depressi, brevis, e setulis simplici serie, numerosis* (8—10), *distinctis, denticulatis, caducis vel deciduis.*

Melanantheræ proximè accedit: affinis quoque Ecliptæ *Linn.* Wedeliæ *Jacq.* et Diomedeæ *Cassini* (in Journ. de Phys. tome lxxxii. p. 145.) sed ab his omnibus satis distincta videtur.

* Collect. ii. p. 291. Ic. Rar. iii. t. 583.

in

in Compositæ, especially in the tribe of *Helianthea*, to which Melananthera belongs.

In M. Cassini's Memoir on the Stamina of Compositæ the retraction of antheræ is not expressly noticed. This appearance, however, can hardly have escaped so accurate an observer; and his opinion respecting its cause may perhaps be inferred from an observation he has made on the stamina of the tribe in which it is most remarkable, namely *Helianthea*; whose filaments below the joint, he says, wither very soon after fœcundation*. To this withering, which he does not mention as occurring in any other tribe, the phænomenon in question may be supposed to be ascribed.

But it appears to me, that the contraction or collapse of the filaments, from their previous state of extension, is a vital action, and not the effect of withering or decay, which, however, speedily follows it. For the contraction may in great part be prevented by the separation of the floret, when the filaments are in the state of extension: and in many genera of Compositæ the antheræ are never retracted, but continue to project till they fall off with the corolla.

This contraction is also analogous to the more evident motion or irritability of the filaments long ago noticed by Borelli and Alexander Camerarius† in certain *Cinarocephalæ*; and more fully described in the same tribe by Dal Covolo‡; whose observations are confirmed and extended to other subdivisions of Compositæ by Koelreuter§. A similar contraction and

* Journal de Physique, tome lxxviii. p. 278.

† Ephemerid. Acad. Nat. Curios. cent. ix. et x. p. 194.

‡ Discorso della Irritabilita d'alcuni Fiori. Firenze 1764.

§ Von Einigen das Geschlecht der Planzen betreffenden versuchen. 3. fortsez. p. 125.

irritability

irritability of the style has been lately described by Mr. Ker in certain species of *Arctotis**.

The *second* species added to the genus by Willdenow is *Calea lobata*, which Linneus, from the general appearance, I conclude, rather than from actual examination of the plant in Clifford's Herbarium, had referred to *Conyza*; and having no specimen in his own Herbarium, the twofold error of supposing it to belong to Polygamia superflua, and to have a naked receptacle, remained uncorrected in all his subsequent works.

Its real structure was first pointed out by Professor Swartz, who consequently referred it to *Calea*, with the character of which it exactly agrees. This alteration is adopted in the first edition of Hortus Kewensis, where the generic character of *Calea* is modified, to admit those species that are without pappus; and by Gærtner, who limits the genus to *C. lobata* and *C. jamaicensis*, as the only species that correspond with the Linnean character. But as *C. jamaicensis*, the original species of *Calea*, has been shown to have a pappus of a very different kind, it becomes necessary to give a new name to *Calea lobata*; and some additions being also wanting to its generic character, I propose the following, and the name of

Neurolæna.

Calea *Gært.*

Involucrum imbricatum, foliaceum. *Receptaculum* paleaceum, planiusculum. *Flosculi* tubulosi, uniformes, hermaphroditi. *Antheræ* inclusæ, basi muticæ (emarginatæ). *Stigmata* acuta, recurva. *Pappus* capillaris, denticulatus, persistens.

Frutex (Americæ æquinoctialis) *erectus*. Folia *alterna, indivisa, et lobata*. Corymbus *terminalis, compositus*. Involucri *subovati foliola*

* Botanical Register, i. 34.

liola obtusa, nervosa. Paleæ receptaculi *involucro subsimiles.* Corollulæ *flavæ**.

The *third* species, *Calea pinifolia*, is adopted from Forster's Florulæ Insularum Australium Prodromus.

The specimen of this plant in George Forster's Herbarium (now forming part of the extensive collection of Mr. Lambert) is very imperfect; it evidently, however, belongs to the same species with a more complete specimen received, without a name, from Forster by Sir Joseph Banks, in whose Herbarium I have examined it, and ascertained that it has a naked receptacle. It therefore cannot be a species of *Calea*, which I have no doubt Forster considered it merely from a certain degree of resemblance to his *Calea leptophylla*. From the structure of its stigmata, antheræ, and involucrum, *Calea pinifolia* belongs, indeed, to a very different tribe, and might even be referred to *Gnaphalium* as it at present stands. But this extensive and ill defined genus evidently requires reformation;

* There are two other genera in many respects agreeing with the character here given of *Neurolæna*, which it is necessary to point out. The first is *Carphephorus* of M. Cassini (in Bulletin des Sciences 1816, p. 198), sufficiently distinct in having the stigmata of *Eupatorium* or *Liatris* with the habit of the latter, from some species of which it differs only in its receptacle having paleæ. The second, not yet described, may be named

PIPTOCARPHA.

Involucrum imbricatum, turbinatum, scariosum. *Receptaculum: paleis* distinctis. *Flosculi* tubulosi, uniformes, limbo revoluto. *Antheræ* exsertæ, basi bisetæ. *Stigmata* filiformia, acuta, hispidula. *Pappus* pilosus.

Frutex (Brasiliensis) *ramosissimus, decumbens?* Folia *alterna, integerrima, subtus incana.* Involucra *axillaria et terminalia, fasciculata, glabruta, squamis sessilibus obtusiusculis enerviis, textura uniformi.* Paleæ *receptaculi squamis intimis involucri subsimiles, et unà cum iisdem deciduæ.* Corollulæ *glabræ.* Setæ antherarum *integerrimæ.* Pappus *albus, radiis simplici serie.*

OBS. I have not seen perfect seeds; and as even in the unripe state they fall off along with the inner squamæ of the involucrum, and the antheræ project in a remarkable degree, it is possible the plant here described may be only the male of a diœcious species: it certainly, however, belongs to a genus not before published.

and if the necessity for its subdivision be admitted, it will also, I believe, be found most expedient to apply the name *Gnaphalium* to that section to which *G. luteo-album*, *sylvaticum*, and *uliginosum* belong, and which is characterized by its naked receptacle, its involucrum connivent at top and of equal height with the truncated capitulum, which consists of numerous filiform female florets in the circumference, with a smaller number of hermaphrodite florets in the disk, both of them ripening seeds and having a sessile capillary deciduous pappus.

To *Gnaphalium* so limited *Calea pinifolia*, a shrub with nearly acerose leaves, and in which all or most of the flosculi are hermaphrodite and the radii of the persistent pappus somewhat thickened upwards, cannot be referred.

It seems, however, to approach more nearly to *Antennaria*, a genus separated from *Gnaphalium* by Gærtner, but which, as he has proposed it, consists of three tribes of plants sufficiently dissimilar in habit and structure to justify a further subdivision; and, what is remarkable, none of them entirely agreeing with his generic character.

The first tribe consists of herbaceous plants, natives of Europe and North America, having the male and female flosculi in distinct involucra and on different individuals. To this genus the name Antennaria* may remain, though descriptive of the pappus

* Antennaria.

Antennariæ species. *Gærtner.* Gnaphalii species. *Linn. Jussieu.*

Involucrum imbricatum, scariosum, coloratum. *Receptaculum* epaleatum, scrobiculatum. *Flosculi* dioici. *Masculi: antheris* basi bisetis: *stigmatibus* truncatis: *Pappo* vel penicillato v. apice incrassato. *Feminei* filiformes, limbo parvo: *staminum* rudimentis nullis: *Pappo* capillari.

Herbæ *perennes, tomentosæ, incanæ.* Folia *plana, adulta sæpe super glabriuscula; radicalia in plerisque latiora.* Inflorescentia *corymbosa rarò solitaria.* Involucri *turbinati vel quandoque hemisphærici squamæ e basi calycina superne coloratæ (albæ v. purpurascentes).* Corollulæ *flavæ.* Antheræ *semiexsertæ.* Pappus *marium niveus, opacus.*

Obs.

pappus of the male flower only. Its species are *Gnaphalium dioicum* Linn., *alpinum* L., *carpaticum* Wahlenberg, *plantagineum* L., and *G. margaritaceum* L.

The second tribe, consisting of *Gnaphalium Leontopodium* and

Obs. *Gnaphalium margaritaceum*, which I have referred to this genus, was first described by Clusius; from whose account it appears to have been introduced into the English gardens from America towards the end of the sixteenth century.

It has ever since been very generally cultivated, as an ornamental plant, both in this country and on the continent of Europe; and has a place in several of the European Floras, as well as in those of North America. It is surprising, therefore, that hitherto the male plant only should have been observed, uniformly, however, considered as hermaphrodite, except by M. Cassini, who in his first memoir on *Synantheræ* (in Journal de Physique, tome lxxvi. p. 200) suspects it to be male, from the imperfect appearance of the ovarium.

That this species of *Gnaphalium* is really diœcious, I learned several years ago from the inspection of a specimen of the female plant in the Herbarium of Sir Joseph Banks, who found it on the banks of the Rymney in Glamorganshire, where the plant was first observed by Lhwyd. I have since received several specimens of both sexes from Mr. Bicheno, to whom I had mentioned this fact, and who obligingly undertook to observe the different states of the plant in the same place, where it seems to be really indigenous. I have never been able to discover any female florets in the circumference of the capitulum of the male plant; but in the centre of the female capitulum I have always found two or three imperfect male florets, whose antheræ, although cohering and of the usual form, appear to be destitute of pollen.

The separation of sexes in a still more common plant of this class, namely, *Serratula tinctoria*, has been equally overlooked.

All the authors who have noticed this species, which is included in almost every European Flora, as well as in more than one recent Monograph of the genus, have considered it as hermaphrodite, while it really belongs to *Polygamia diœcia*, or has its perfect sexual organs on different plants. The hermaphrodite plant, apparently perfect, but which I believe very seldom ripens seed, is well figured by Schkuhr (in Botanisches Handbuch, tab. 234); and the female, whose stigmata are remarkably developed and undulated, while the antheræ are evidently imperfect, and which generally produces ripe seeds, is represented in English Botany (tab. 38), in Flora Danica (281), and probably also in Svensk Botanik (170). For my knowledge of this fact respecting *Serratula tinctoria* I am indebted to the Rev. Robert Bree of Camberwell, who pointed out to me both its states, which he was then disposed to consider as distinct species.

Leontopodioides, which may be called Leontopodium, is in affinity intermediate between *Antennaria* and *Gnaphalium* as here limited, but has sufficient characters to distinguish it from both.

The third tribe has been found only in South Africa, and consists of shrubs with small rigid heath-like leaves, of which the margins are incurved, the upper surface tomentose, and the under convex and nearly smooth; but by a remarkable twisting they are in most of the species resupinate; a character which seems to have been overlooked in all the described species; namely, *Gnaphalium muricatum*, *mucronatum*, and *seriphioides*. In this tribe, or genus, which may be named Metalasia, the involucrum is generally cylindrical, and in most of the species has a short radius formed by the spreading coloured laminæ of the inner scales; the flosculi are few in number, and all hermaphrodite; and the radii of the pappus, which fall off separately, are either thickened or more strongly toothed at top.

Calea pinifolia does not even belong to this genus, though it has a nearly similar habit; but the margins of its leaves are revolute, and their tomentum chiefly on the under surface. In these respects, as well as in the principal characters of fructification, it agrees with several shrubs, chiefly of New Holland and Van Diemen's Island; among which are *Eupatorium ferrugineum*, *Eupatorium rosmarinifolium*, and *Chrysocoma cinerea* of M. Labillardiere. Part of these have the inner squamæ of the involucrum simple, as seems to be the case in *Calea pinifolia*; while in others, as the two species referred to *Eupatorium* by M. Labillardiere, they form a short radius. These I am inclined to consider merely sections of one and the same genus, which may be distinguished by the following character, and named

Ozothamnus.

Ozothamnus.

Involucrum imbricatum, scariosum, coloratum. *Receptaculum* epaleatum, glabrum. *Flosculi* (pauciores quam 20) tubulosi, vel omnes hermaphroditi, vel paucissimi feminei angustiores in ambitu. *Antheræ* (inclusæ,) basi bisetæ. *Stigmata* apice obtuso subtruncato hispidulo. *Pappus* sessilis, pilosus, nunc penicillatus, persistens.

Frutices (Novæ Hollandiæ et Novæ Zelandiæ, vix Africæ australis,) *graveolentes, tomentosi.* Folia *sparsa, integerrima, marginibus sæpius recurvis.* Inflorescentia *terminalis, corymbosa v. congesta.* Involucra *alba v. cinerea : squamis intimis nunc conformibus et conniventibus ; nunc laminis patulis niveis radium brevem obtusum efformantibus.* Corollulæ *luteæ.* Pappus *albus.*

The *fourth* species added to *Calea* by Willdenow is *Calea leptophylla* of Forster, whose specimens I have examined in Mr. Lambert's Herbarium. Amongst Forster's drawings, formerly referred to, there is a coloured figure of this plant, by which it appears that he originally considered it to belong to *Gnaphalium.* From this genus he afterwards removed it, probably on finding it referred to *Calea* in the collection of Sir Joseph Banks, by whom it was discovered in New Zealand in a more perfect, at least in a more luxuriant state.

This plant, though agreeing with *Calea* in every part of the Linnean essential character, differs remarkably from it in other points of nearly equal importance, as well as in habit ; and along with *Calea aculeata* of M. Labillardiere, and several other species also natives of New Holland and Van Diemen's Island, constitutes a genus very nearly related to *Ozothamnus*, from which it is to be distinguished chiefly by the paleæ of its receptacle.

I propose

I propose to name this genus in honour of *M. Henri Cassini*, whose well conducted investigation of Compositæ has already thrown much light on the structure and economy of the more important parts of fructification of this difficult class: and especially of those organs from which the distinguishing characters of *Cassinia* are here derived.

I shall add the characters of the species of this genus, which, like *Ozothamnus*, admits of subdivision into two sections; and I have appended to it *Calea spectabilis* of Labillardiere, a plant corresponding with it in character, but differing very much in habit from all the other species.

Cassinia.

Caleæ sp. *Labillardiere.*

Involucrum imbricatum, scariosum, pauciflorum. *Receptaculum*: *paleis* distinctis, squamis intimis involucri subsimilibus. *Flosculi* tubulosi, vel omnes hermaphroditi vel paucissimi feminei angustiores in ambitu. *Antheræ* (inclusæ) basi bisetæ. *Stigmata* apice obtuso subtruncato hispidulo. *Pappus* pilosus v. penicillatus, persistens.

Frutices. Folia *sparsa, sæpius angustata, marginibus recurvis.* Inflorescentia *terminalis, corymbosa rariusve paniculata.* Involucra *alba nunc cinerea raro aurea; squamis intimis sæpius apice conniventibus, nunc patulis et radium brevem obtusum efformantibus.*

† *Involucrum radiatum* (*squamis intimis apice patulis*).

1. C. *leptophylla*, foliis lineari-lingulatis subter ramulisque incanis, corymbis terminalibus, involucris turbinatis.

Calea leptophylla. *Forst. Prodr. n.* 287. *Willd. Sp. Pl.* iii. *p.* 1796. *Persoon Syn.* ii. *p.* 406. *Poiret Encycl. Suppl.* ii. *p.* 28.

Loc.

Loc. Nat. Novæ Zelandiæ campi arenosi prope Tolaga, &c. *D. Banks.* Prope Queen Charlotte's Sound *J. R. et G. Forster.* (v. s. in Herb. Banks et G. Forster).

†† *Involucrum connivens.*

A. *Fruticosæ.*

2. C. *denticulata*, foliis ovalibus oblongisve acutis spinuloso-denticulatis subter tomentosis, corymbis compositis, involucris hemisphæricis.

Loc. Nat. Novæ Hollandiæ ora orientalis prope Port Jackson. *David Burton.* (v. s. in Herb. Banks.)

3. C. *longifolia*, foliis lanceolato-linearibus elongatis lævibus subter tomentosis, corymbis decompositis, involucris turbinatis.

Loc. Nat. Novæ Hollandiæ ora orientalis prope Port Jackson; in dumetis. (v. v.)

4. C. *aurea*, foliis lanceolato-linearibus elongatis lævibus subter glandulosis, corymbis decompositis, involucris ovalibus: squamis apice aureis.

Loc. Nat. Novæ Hollandiæ ora orientalis prope Port Jackson; in sylvis et dumetis. (v. v.)

5. C. *aculeata*, foliis angusto-linearibus margine revolutis super hispidulis subter ramulisque incanis, corymbis compositis decompositisve congestis, involucris turbinatis.

Calea aculeata. *Labill. Nov. Holl.* ii. *p.* 41. *t.* 185. *Persoon Syn.* ii. *p.* 406. *Poiret Encycl. Suppl.* ii. *p.* 28.

Loc. Nat. Insula Van Diemen; in dumetis et ad ripas fluv. (v. v.)

6. C. *affinis*, foliis angustato-linearibus margine revolutis super hispidulis

hispidulis subter concoloribus, corymbis decompositis congestis, involucris turbinatis.

Loc. Nat. Novæ Hollandiæ ora orientalis prope Port Jackson; in dumetis. *D. G. Caley.* (v. s.)

Obs. C. aculeatæ nimis affinis.

7. C. *lævis*, foliis angustissime linearibus margine revolutis super lævibus subter ramulisque incano-tomentosis, corymbis compositis, involucris congestis cylindraceis.

Loc. Nat. Novæ Hollandiæ ora australis; in campis ad radices montium prope ortum Spencer's Gulph. (v. v.)

8. C. *arcuata*, foliis angustissime linearibus margine revolutis super lævibus subter ramulisque incano-tomentosis, panicula pyramidata, involucris spicatis cylindraceis arcuatis.

Loc. Nat. Novæ Hollandiæ ora australis; in campis elevatis prope ortum Spencer's Gulph. (v. v.)

9. C. *quinquefaria*, foliis angustissime linearibus super ramulisque glabris, panicula decomposita, involucris turbinatis: squamis 5-fariis.

Loc. Nat. Novæ Hollandiæ ora orientalis prope Port Jackson; in montosis. *D. G. Caley.* (v. s.)

†† B. *Herbacea.*

10. C. *spectabilis*, panicula decomposita, foliis lanceolatis decurrentibus subter ramisque lanatis.

Calea spectabilis. *Labill. Nov. Holl.* ii. *p.* 42. *t.* 186. *Persoon Syn.* ii. *p.* 406. *Poiret Encycl. Suppl.* ii. *p.* 28.

Loc. Nat. Novæ Hollandiæ ora australis; in sylvis dumetisque prope Memory Cove, Port Lincoln, &c. legi. In Insula Van Diemen a D. Labillardiere detecta. (v. v.)

Since

Since the publication of Willdenow's Species Plantarum very few alterations have been made in the genus *Calea*.

In Persoon's Synopsis two of the species are excluded; namely, *Calea scoparia*, which, following Swartz, he has referred to *Bacharis*; and *Calea aspera*, adopted from Richard as a species of *Melananthera*. The additional species in the work referred to are *C. cordifolia* of Swartz, already noticed as a genuine *Calea*; *C. aculeata* and *spectabilis* of Labillardiere, which belong to *Cassinia*; and *C. cordata*, adopted from Loureiro, of whose plant nothing is known except from the short description in Flora Cochinchinensis, which is only sufficient to render it probable that it neither belongs to *Calea* as I have proposed to limit it, nor to any of the genera hitherto confounded with it.

M. Poiret, in the Supplement to the Botanical Dictionary of the Encyclopédie Méthodique, has under the article *Calea* retained all the species of this genus given by Persoon; and also *Calea aspera*; which, however, he has in a subsequent article correctly referred to *Melananthera*.

Connected with the proper subject of this paper, I shall describe and add some observations on a plant lately sent from Brazil by Mr. Sellow; which, though not strictly referable to Compositæ, probably belongs to a genus at present included in this family; and conclude with a few remarks on the structure and affinities of *Brunonia*.

I have named the Brazil plant

ACICARPHA SPATHULATA.

Herba annua? glaberrima, ramosa, diffusa. *Rami* adscendentes, angulati. *Folia* sparsa, petiolata, exstipulata, spathulata mucronulo brevissimo, sesquiuncialia, crassiuscula? glauca? sæpiùs integerrima; inferiora quandoque extra medium dentata.

Petioli lineares basi parum dilatata semiamplexicauli; inferiores elongati; superiores plerumque folio aliquoties breviores. *Capitula* solitaria, nunc oppositifolia pedunculata, nunc terminalia subsessilia, basiflora, ovata, flava. *Involucrum* simplici serie pentaphyllum, capitulum floridum superans, foliaceum; foliolis inæqualibus spathulatis sessilibus integerrimis ipsa basi connatis. *Receptaculum* subulato-conicum, paleaceum. *Paleæ* lanceatæ mucronulatæ, inter flosculos hermaphrodito-masculos magis manifestæ, inter hermaphroditos passim abortientes. *Flosculi* tubulosi, uniformes, glabri.

Flosculi ambitûs, duplici triplicive serie, hermaphroditi, utroque organo perfecto. *Corollæ Tubus* gracilis cylindraceus, cum ovario continuus, basique stylo accretus, per lentem 10-striatus. *Limbus* infundibuliformis, 5-fidus, æstivatione valvata; laciniis semilanceolatis, planis, trinerviis; nervis lateralibus margine parallelo-approximatis, indivisis, apice confluentibus, e nervis alternis tubi infra sinus furcatis ortum ducentibus.

Stamina 5 epipetala, limbi laciniis alternantia.

Filamenta inferne cum tubo arcte connata, superne libera, fauci quasi inserta, invicem cohærentia in tubulum 5-dentatum, ipsis apicibus, subito mutatione texturæ, articulatis; basi intus incrassatum arcis 5 oblongis cum filamentorum axibus alternantibus.

Antheræ continuæ, lineares, dimidio inferiore arcte cohærentes, superiore liberæ; biloculares, loculis longitudinaliter dehiscentibus, valvula interiore angustiore, receptaculo pollinis utriusque loculi longitudinali septiformi: basi emarginatæ, lobulis posticis acutiusculis brevibus polliniferis; apice simplices connectivo ultra loculos haud producto. *Pollen* subglobosum, per lentem pluries augentem obsolete angulatum.

Ovaria connata, singula coronata *calyce* 5-fido dentibus spinescentibus cum laciniis limbi corollæ alternantibus; monosperma, ovulo

ovulo ovato pendulo, paulo infra apicem affixo funiculo crassiusculo ex ipso apice angustato cavitatis orto; chorda vasculari a puncto insertionis ad extremitatem inferiorem ejusdem lateris attingenti. *Stylus* filiformis glaber, inferne cum basi tubi corollæ connatus. *Stigma* simplex obtusum hispidulum.

Flosculi superiores numerosi hermaphrodito-masculi, paulo minores hermaphroditis, calycis laciniis submembranaceis; ovariis (pariter connatis) imperfectis, sæpius absque ovulo.

Pericarpia (flosculorum ambitûs): *Achenia* conferruminata, singula coronata calyce aucto 5-spinoso, spinis patulis conico-subulatis e substantia suberosa axi solidiori rigida.

Semen pendulum, ovatum extremitate superiore acuminato: *testa* membranacea: *membrana propria* nucleo adhærens. *Albumen* figura seminis, carnosum, copiosum, album. *Embryo* axilis, subcylindraceus, longitudine fere albuminis, albus, dicotyledoneus. *Cotyledones* lineares, obtusæ, plano-convexæ, vix longitudine *Radiculæ* cylindraceæ, superæ.

Notwithstanding the great difference between my account of this plant and that given by M. de Jussieu of his *Acicarpha tribuloides*, I have very little doubt that they both belong to the same genus; though from the above description it is evident that *Acicarpha spathulata* is not referable to Compositæ. To this plant *Calycera* of Cavanilles, in the seeds of which M. Correa has found albumen, seems to be very nearly related; and a third genus, probably referable to this group, is *Boopis*, described by M. de Jussieu in the same Memoir with *Acicarpha*. The important characters, however, of the pendulous ovulum and inverted embryo remain to be ascertained in all these; and the presence of albumen in *Acicarpha tribuloides* (in *Acicarpha lanata* of Lagasca in Pers. Syn. ii. p. 488, if it really belong to this genus), and

in both species of *Boopis*. Another question respecting the latter genus is, whether its capitulum be simple, as it certainly is in *Acicarpha spathulata*; or compound, as Jussieu's figure of *Boopis anthemoides* seems to indicate.

In the mean time, with the necessary knowledge of structure of *Acicarpha spathulata* only, I shall venture to propose this group as a distinct natural family to be placed between Compositæ and Dipsaceæ; though upon the whole somewhat more nearly approaching to Compositæ. This family, if my conjectures respecting *Calycera* and *Boopis* should be hereafter verified, may be called Calycereæ; *Acicarpha* even as a generic name being barely tenable, provided the original species agrees with that here described: for on this supposition, M. de Jussieu has mistaken the laciniæ of the perianthium for paleæ of the receptacle, deriving the name of the genus from their form; and has entirely overlooked the real paleæ, which, though they could not have suggested this name, may however sanction its being retained, if it be not still better to change it to *Acicarpa*.

It will be attended with similar advantage to form a separate family of

Brunonia,

as a link of equal importance, connecting *Compositæ* with *Goodenoviæ*, but from both of which it is in many respects very distinct. As I have formerly described this genus, and made several observations on its principal affinities*, I shall here only state the more important relations and distinctions between it and those families to which it appears to me most nearly to approach.

Brunonia agrees with *Goodenoviæ* in the remarkable indusium of the stigma; in the structure and connexion of the antheræ; in

* Prodr. Flor. Nov. Holl. p. 589.

the

the seed being erect; and essentially in the æstivation of corolla. It differs from them in having both calyx and corolla distinct from the ovarium; in the disposition of vessels in the corolla; in the filaments being jointed at top; in the seed being without albumen; and in its remarkable inflorescence, compatible, indeed, with the nature of the irregularity in the corolla of *Goodenoviæ*, but which can hardly coexist with that characterizing *Lobeliaceæ**.

With *Compositæ* it agrees essentially in inflorescence; in the æstivation of corolla; in the remarkable joint or change of texture in the apex of its filaments; and in the structure of the ovarium and seed. It differs from them in having *ovarium liberum* or *superum*; in the want of a glandular disk; in the immediately hypogynous insertion of the filaments; in the indusium of the stigma; and in the vascular structure of the corolla, whose tube has five nerves only, and these continued through the axes of the laciniæ, either terminating simply (as is at least frequently the case in *Brunonia sericea*), or (as in *B. australis*) dividing at top into two recurrent branches forming lateral nerves, at first sight resembling those of Compositæ, but which hardly reach to the base of the laciniæ.

It is a curious circumstance that *Brunonia* should so completely differ from Compositæ in the disposition of vessels of the corolla, while both orders agree in the no less remarkable structure of the jointed filament; a character which had been observed in a very few Compositæ† only before the publication of M. Cassini's second Dissertation, where it is proved to be nearly universal in the order.

In the opposite parietes of the ovarium of *Brunonia* two nerves or vascular cords are observable, which are continued into the style, where they become approximated and parallel. This struc-

* See Flinders's Voyage to Terra Australis, ii. p. 559.

† Batsch Anal. Flor. p. 107; et Schkuhr Handb. tab. 236 et 244.

ture,

ture, so nearly resembling that of Compositæ, seems to strengthen the analogical argument in favour of the hypothesis advanced in the present paper—of the compound nature of the pistillum in that order, and of its type in phænogamous plants generally;—*Brunonia* having an obvious and near affinity to *Goodenoviæ*, in the greater part of whose genera the ovarium has actually two cells with one or an indefinite number of ovula in each; while in a few genera of the same order, as *Dampiera*, *Diaspasis*, and certain species of *Scævola*, it is equally reduced to one cell and a single ovulum.

Sir James Smith, in establishing *Brunonia* as a genus, is disposed to refer it to *Dipsaceæ*. To certain species of this order it, indeed, bears a striking resemblance in habit; it also very nearly agrees with them in its remarkable inflorescence; and one great objection to its union with them may be supposed to be removed in adopting M. Decandolle's account of their ovarium.

But as *Brunonia* differs from the whole order in the following characters, all of which are of primary importance;—namely, in the origin and æstivation of corolla; in the insertion and whole structure of stamina; in the indusium of the stigma; in the ovulum being inserted at the base of the cavity of the ovarium; in the erect embryo and want of albumen;—I continue to think that its proper place in the natural method is between *Goodenoviæ* and *Compositæ*.

I shall conclude this subject, by proposing a few queries respecting the indusium of *Brunonia* and *Goodenoviæ*.

Is this remarkable covering of the stigma in these families merely a process of the apex of the style? or is it a part of distinct origin, though intimately cohering with the pistillum? On the latter supposition, may it not be considered as analogous to the glandular disk surrounding or crowning the ovarium in many other

other families? And, in adopting the hypothesis I have formerly advanced* respecting the nature of this disk in certain families, —namely, that it is composed of a series of modified stamina,— has not the part in question a considerable resemblance in apparent origin and division to the stamina of the nearly-related family *Stylideæ?*

To render this supposition somewhat less paradoxical, let the comparison be made especially between the indusium of *Brunonia* and the imperfect antheræ in the female flowers of *Forstera*. Lastly, connected with this view, it becomes of importance to ascertain whether the stamina in *Stylideæ* are opposite to the segments of calyx or of corolla. The latter disposition would be in favour of the hypothesis. This, however, is a point which will not be very easily determined, the stamina being lateral. In the mean time, the existence and division of the *corona faucis* in *Stylidium* render it not altogether improbable that they are opposite to the segments of the corolla.

Since the preceding paper was submitted to the Society, M. Cassini has published† the substance of a Memoir, which he read to the Academy of Sciences of Paris in August last, on a new family of plants named by him Boopideæ, and consisting of *Calycera*, *Boopis*, and *Acicarpha*. I have also, through the liberality of Messrs. de Jussieu, Desfontaines, and Baron Delessert, had the opportunity of examining specimens of *Acicarpha tribuloides* in flower and fruit, of both species of *Boopis* in flower, and detached flowers and pericarpia of *Calycera*. In all of these I have found the ovulum pendulous; and in *Acicarpha* and *Calycera* an inverted embryo occupying the axis of a fleshy albumen.

* Linn. Soc. Transact. x. p. 159. † Bulletin des Sciences, 1816. p. 160.

My

My conjectures, therefore, on their structure and relation to *Acicarpha spathulata* of the preceding paper, are completely verified by this examination, as well as by the observations of M. Cassini, who with his usual acuteness has detected the principal characters distinguishing *Boopideæ* from Compositæ and Dipsaceæ, between which he has also placed them.

As M. Cassini's Memoir, though read subsequently to mine, is already published, the name *Calycereæ*, which I have proposed for this family, is superseded by that which he has given it.

But as his account of the order is by no means complete, several characters of considerable, though not primary, importance being entirely omitted, I may be allowed to add to my paper some remarks on the more essential points of resemblance and difference between it and the two families to which it is most nearly related.

The principal characters distinguishing *Boopideæ* from the whole of *Compositæ* are the pendulous ovulum and the albumen inclosing the embryo, of which the radicle points to the apex of the pericarpium. It appears to me necessary to state all these characters, and nearly in the terms in which they are here given: for, 1st, A pendulous ovulum most frequently, indeed, is not, however, invariably connected with *radicula supera*, though that direction of radicle might here, as well as in Compositæ, with confidence have been inferred from the vascular structure of the ovulum*. 2dly, Where the insertion of the ovulum is, as in this family, evidently below the upper extremity, the radicle which

* Some of the indications in many cases afforded by the structure of the unimpregnated ovulum, of the position and direction of the parts of the future embryo, have hitherto been overlooked: the subject, however, for its elucidation requires details incompatible with the limits of the present communication. I have in another place (Flinders's Voyage to Terra Australis, ii. p. 601.) thrown out a similar hint, which has probably attracted no attention, and must reserve the explanation of both for a separate essay.

points

points to this extremity cannot in strict propriety be described as directed towards the umbilicus. M. Cassini has not noticed the direction of the radicle; either from supposing it constantly connected with that of the ovulum, or, which is more probable, from not having ascertained it.

These distinctive characters may be considered as fully sufficient to authorize the separation of *Boopideæ* from Compositæ; yet the same differences exist between certain genera referred and really belonging to *Rubiaceæ* and the principal part of that order.

There are, however, three other characters unnoticed by M. Cassini, which distinguish the flowers of *Boopideæ* from the hermaphrodite flowers of the whole of Compositæ; namely, the accretion of the base of the style with the tube of the corolla; the absence of the epigynous disk or nectarium; and the longitudinal subdivision of each cell of the anthera by a "receptaculum pollinis," as in most other families, and of which, indeed, there seems to be the rudiment in the syngenesious genus *Petrobium*, described in the preceding paper.

In the partial cohesion of the antheræ, in which they resemble *Jasione*, they certainly differ from all known Compositæ: but as in certain Compositæ the antheræ are very slightly connected or entirely distinct;—this, though a remarkable circumstance, can hardly be employed as a distinguishing character.

The principal characters in which *Boopideæ* differ from the greater part, though not from the whole of Compositæ, are the corolla being continuous, or not jointed, with the ovarium; the antheræ having no membranaceous appendix at top; and the undivided stigma.

Boopideæ differ from *Dipsaceæ* in the vascular structure and valvular æstivation of corolla; in the æstivation, insertion, and con-

nexion of antheræ; in the absence of the partial involucrum; and in having alternate leaves.

In adopting M. Decandolle's description of *Dipsaceæ**, they would differ also in the important character of "ovarium inferum." This distinction, however, is neither universal, nor I believe absolute in any case.

M. Auguste Saint Hilaire in his excellent Memoir on *Primulaceæ*†, while he admits the correctness of M. Decandolle's account with respect to great part of *Dipsaceæ*, has at the same time well observed, that in several species of *Scabiosa* the ovarium is entirely united with the tube of the calyx. But neither of these authors has remarked the curious, and I believe peculiar, circumstance, of the base of the style cohering with the narrow apex of the tube of the calyx, even in those species of the order in which the dilated part of the tube is entirely distinct from the ovarium.

This kind of partial cohesion between pistillum and calyx is directly opposite to what usually takes place, namely, the base of the ovarium being coherent, while its upper part is distinct. It equally, however, determines the apparent origin or insertion of corolla and stamina, producing the unexpected combination of "flos superus" with "ovarium liberum."

In the vascular structure of the corolla *Boopideæ* may be considered as essentially agreeing with *Compositæ*, in many of whose genera the middle nerves of the tube and segments are equally manifest. In stating the character derived from this source in either of these orders, it is not sufficient to describe the nerves of the laciniæ only as M. Mirbel has done in his character of Compositæ‡, and M. Cassini in that of Boopideæ: but it is also neces-

* Flor. Franc. 3me ed. vol. iv. p. 221. † Mem. du Mus. d'Hist. Natur. ii. p. 47.

‡ Elemens de Physiol. Veget. et de Botan. ii. p. 885.

sary

sary to give their disposition in the tube or undivided part of the limb; there being instances in both families where the lateral nerves of the segments do not unite at top; and, as has been formerly remarked, several examples in other families of a nearly similar disposition in the segments, accompanied by a different disposition in the tube. To the examples of this kind formerly given, *Globularia cordifolia* may be added, in the segments of whose lower lip there are three simple nerves, of which the lateral do not unite at top, and continue distinct nearly to the base of the tube, where they converge and appear to unite with the middle nerve.

In *Acicarpha* and *Boopis* the filaments appear to me jointed as in Compositæ; a character I have not been able to observe in the very few flowers which I have examined of *Calycera*.

In *Acicarpha* the florets of the circumference are hermaphrodite and apparently complete, the antheræ containing pollen and the ovaria producing seed; while those of the disk are male with an incomplete pistillum. Such an arrangement has not hitherto been observed in Compositæ, in which, wherever the central florets are male with an imperfect pistillum, those of the circumference are female with or without the rudiments of stamina.

The regularity in the order of expansion of flowers from the base to the top of the capitulum in *Acicarpha tribuloides* and *spathulata*, and the irregularity, approaching to the inverted order, which I have found to exist in both species of *Boopis*, seem to prove the capitulum to be simple in the former genus and compound in the latter, notwithstanding the great resemblance between their involucra. The exact nature of its composition, however, in *Boopis* can only be satisfactorily determined in recent specimens.

This irregular expansion in *Boopis*, which renders even the generic name improper, and at present the want of satisfactory characters to distinguish it from *Calycera*, are objections to the name M. Cassini has chosen for this family; while that of *Calycereæ*, which I have proposed, derived from the genus first described, and applicable to all the genera of the order, appears to me unexceptionable: especially as there seems no reason to doubt that the part which I have considered as calyx in *Boopideæ* is really such; its divisions being generally in equal number, and alternating with those of the corolla. It may be observed that a like alternation of the divisions of the pappus with the segments of the corolla obtains in those genera of Compositæ where both parts are in equal number. But in some cases, where the division of pappus is still further reduced, the same alternation does not exist, especially in those genera having vertically compressed pericarpia and two aristæ, as *Spilanthus* and *Salmea*.

The absence of "discus epigynus" in *Boopideæ* is a necessary consequence of the accretion of the base of the style with the tube of the corolla. It seems to me, however, that a modification of the same organ may be traced in the five thickened areolæ observable within and near the base of the tube formed by the filaments in *Acicarpha spathulata*; and much more distinctly in the same situation in *Boopis balsamitifolia*, where they have the appearance of five adnate fleshy bodies alternating with the filaments.

This apparent decomposition of the glandular disk in *Boopideæ*, compared with its state in Compositæ, as well as its transposition and the alternation of its parts with the stamina, seem to give some additional support to the conjecture I have formerly hazarded in the paper on *Proteaceæ*, published in the Society's Transactions (vol. x. p. 159); namely, that in several families—for the

hypothesis

hypothesis not meant to be extended to all—this part, even in its simplest state, may be considered as formed of a series of modified stamina: Or, merely to state the facts from which the conjecture originates, that there are certain families in some of whose genera this organ exists in its simplest form, that of an undivided fleshy ring; while in other genera of the same families it consists of several distinct bodies alternating with the stamina, and in some cases putting on the appearance of barren filaments.

This hypothesis is chiefly applicable to families in which the number of stamina is equal to the divisions of one floral envelope only, the nectarium being supposed to be formed of the second series: but it receives its principal support from *Scitamineæ**, where the glandular bodies belong actually to the same series with the perfect stamen.

I am aware at the same time of several objections to its generalization. Thus, the nectarium or glandular disk exists in families where, though the stamina are definite, they are equal in number to the divisions of calyx and corolla united; and moreover, in such families where it consists of distinct parts, these parts are placed where an addition to the number of stamina is least likely to take place, as in *Crassulaceæ*. Here, however, as in many other cases, the divisions of the disk are opposite to the ovaria; they may therefore be supposed more intimately connected with the pistilla than with the stamina; an opinion which is I believe held, though not yet published, by the ingenious M. Decandolle with respect to *Ranunculaceæ*. In support of this opinion it may be noticed that in *Pæonia Moutan*, where the disk or urceolus is in the state of the greatest development, when a multiplication of the pistilla takes place, which in the double-flowered varieties of this

* See Flinders's Voyage to Terra Australis, ii. p. 574.

species

species it not unfrequently does by the addition of one or more inner series, the rudiments of an analogous disk are produced along with each of the additional series.

Yet, in opposition to this view, I have in a single instance found one of the divisions of the urceolus in *Pæonia Moutan* changed into an anthera; and the divisions of the apparently analogous organ in *Aquilegia*, which in their usual state resemble barren filaments, have sometimes been observed with perfect antheræ*.

* Schkuhr Handbuch, tab. 146.

XII. *On some remarkable Deviations from the usual Structure of Seeds and Fruits. By Robert Brown, Esq. F.R.S., Lib. L.S.*

Read March 5, 1816.

The principal part of the following paper was read to the Society in March 1813. It was then withdrawn with a view of rendering it more perfect by additional facts, which I hoped I might be able to collect. Since that time I have not had it in my power to pay much attention to the subject. As, however, the facts formerly stated appear to me of some importance, and are as yet unpublished, I take the liberty of again submitting them to the Society, along with a few additional instances of anomalies in the structure of seeds and fruits, hardly less remarkable than those contained in the original essay.

It is, I believe, generally admitted by physiological botanists, that the seeds of plants are never produced absolutely naked:—in other words, that the integument through some point or process of which impregnation takes place, cannot properly be considered as part of the seed itself.

That such a covering, distinct from the seed, really exists, may in most, perhaps in all, cases be satisfactorily shown by a careful examination of the unimpregnated ovarium, to a part only of whose cavity the ovulum will be found to be attached.

There are, however, many cases where soon after fœcundation, and more remarkably still in the ripe fruit, this integument acquires

quires so complete and intimate a cohesion with the proper coat of the seed as to be no longer either separable or distinguishable from it.

But systematic botanists have generally agreed to term a naked seed not only this kind of fruit, but every monospermous pericarpium bearing a general resemblance to a seed, and whose outer covering, though distinct from the nucleus, is only ruptured after germination commences.

For the purposes of an artificial arrangement this language may perhaps be sufficiently accurate; but in determining the affinities of plants, it is necessary to express by appropriate terms those differences which are no less important than real.

Of the fruits improperly called naked seeds, there are two principal kinds: The first, in which the pericarpium is distinct from the seed, is termed *Akena* by Richard in his excellent *Analyse du Fruit*; the second, in which the pericarpium coheres with the seed, is the *Caryopsis* of the same author.

An *Akena* (or *Achenium*), even in a separate state, may in general be readily determined. But it is not always equally easy to distinguish a *Caryopsis* from a seed. It may indeed be done in certain cases, as in Grasses, by attending to its surface, in which two distinct and distant cicatrices are observable; the one indicating the point of attachment to the parent plant, the other that by which it was fœcundated. In certain other tribes, however, this criterion cannot be had recourse to, the surface of the *Caryopsis* exhibiting but one areola or cicatrix, which includes the closely approximated points of attachment and impregnation: in such cases, the true nature of the fruit can only be determined by its examination in an earlier stage.

But although it must be admitted that an ovulum is never produced without a covering, through some part of which it is impreg-

impregnated; it is still possible to conceive a case in which a ripe seed may be considered as truly naked while retaining its attachment to the parent plant; and this not subsequent to germination, but even preceding the formation of the embryo. For if we suppose, as the immediate effect of impregnation, a swelling of the ovulum without a corresponding enlargement of the ovarium, the consequence will obviously be a premature rupture of the ovarium, and the production of a seed provided with its proper integuments only.

I am not aware that such an economy has hitherto been described; I have observed it, however, in several plants belonging to very different families, and of essentially different structures.

The first of these is *Leontice thalictroides* of Linneus, *Caulophyllum thalictroides* of Michaux, who has founded his new genus on a difference of fruit, the nature of which he has entirely misunderstood. It is remarkable that its real structure should have escaped so accurate an observer as M. Richard, through whose hands it is generally understood Michaux's work passed previous to its publication; but the fact may at least serve to show how entirely unexpected such an economy must have been even to that excellent carpologist.

My observations were made in the summer of 1812, on a plant of *Leontice thalictroides*, which flowered and ripened fruit in the royal gardens at Kew. An examination of the unimpregnated ovarium proved it to be in every respect of the same structure with that of the other species of *Leontice*; and essentially the same with the whole order of *Berberides*, to which this genus belongs. A careful inspection of the fruit, in different states, proved also that the "Drupa stipitata" of Michaux is in reality a naked seed, that in a very early stage had burst its pericarpium,

the withered remains of which were in most cases visible at the base of the ripe seed. The first error of Michaux naturally led to a series of mistakes; and the naked seed being considered by him as a drupa, the albumen, which is of a horny texture, is described as a "nux cornea crassissima," and the embryo itself as the seed.

But although this account of the fruit of *Leontice thalictroides* be in no respect similar to that given by Michaux, it may perhaps be considered by some as still differing sufficiently from *Leontice* to authorize the establishment of a distinct genus; and that, therefore, the name *Caulophyllum* may be retained, and its character derived from the remarkable circumstance described, namely, the early rupture of its pericarpium. I believe, however, it will be found more expedient to reduce it again to *Leontice*.

For, in the first place, its habit is entirely that of the original species of the genus. And secondly, though the pericarpium of *Leontice Leontopetalum*, which is the type of the genus, remains shut until the ripening of the seeds, and attains a size more than sufficient for the mere purpose of containing them; yet in *Leontice altaica*, a species in other respects more nearly approaching to *L. Leontopetalum* than to *L. thalictroides*, the pericarpium, though it enlarges considerably after impregnation, is ruptured by the seeds long before they have arrived at maturity.

The accompanying drawing, for which I am indebted to my friend Mr. Ferdinand Bauer, will materially assist in explaining the singular economy now described; and may also perhaps render more intelligible the account I proceed to give of the second instance in which I have observed an analogous structure, but to illustrate which I have at present no drawing prepared.

This

This second instance occurs in *Peliosanthes Teta* of Andrews's Repository and the Botanical Magazine.

In this monocotyledonous plant, which in 1812 nearly ripened seed in Mr. Lambert's collection at Boyton, the ovarium coheres with the tube of the perianthium or corolla, and has originally three cells, each containing two ovula. Soon after impregnation has taken place, from one to three of these ovula rapidly increase in size, by their pressure prevent the development of the others, and rupture the ovarium, which remains, but little enlarged at the base of the fruit, consisting of from one to three naked berry-like seeds.

In the Botanical Magazine Mr. Ker, in describing a second species of *Peliosanthes**, takes the opportunity of altering in some respects the character of the genus he had previously given, and of adding a description of its supposed pericarpium, from an inspection, as it seems, of the unripe fruit of *Peliosanthes Teta*. It is evident, however, that he is not aware of its real structure; and consequently does not succeed in reconciling its appearance with the unquestionable fact of its having "germen inferum."

There are some cases in which this early opening of the ovarium, instead of being, as in the preceding instances, an irregular bursting, apparently caused by the pressure of the enlarged ovula, is a regular dehiscence in the direction of the suture. Of this *Sterculia platanifolia* and *S. colorata* are remarkable examples; their folliculi after opening, which takes place long before the maturity of the seeds, acquiring the form and texture of leaves, to whose thickened margins the ovula continue firmly attached until they ripen. Another example of this early and regular dehiscence occurs in an undescribed genus of the same family, which differs from *Sterculia platanifolia* in its pericarpium having a terminal wing and a single seed.

* Botan. Magaz. 1532.

In the specimens of a plant lately sent from Brazil by Mr. Sellow, I observe a similar economy. In this case the ovarium, which is originally unilocular with five parietal placentæ, soon after fecundation opens regularly into five equal foliaceous valves, to the inner surface of each of which an indefinite number of ovula are attached.

The genus *Reseda*, whose capsule opens at top at a very early period, may be considered as affording another instance, though much less remarkable, of the same anomaly. And it is possible this may be the real structure in certain cases of which a very different view has been taken.

In the instances of naked seeds now given, the bursting of the pericarpium precedes the distinct formation of the embryo, while the proper coats of the seed remain entire till after its separation from the parent plant, and germination has commenced.

It may not be uninteresting to contrast this economy with that of the Mangroves and other plants of tropical countries, which grow on the shores, and within the influence of the tide. In many of these the embryo, long before the seed loses its original attachment, acquires a very considerable size; and the first effect of this unusual development is the rupture, in most cases succeeded by the complete absorption or disappearance, of the proper integument of the seed. In some instances the development proceeds still further, and the pericarpium itself is perforated by the embryo, which, while preserving its connexion with the parent plant, often attains the length of from eighteen inches to two feet. This happens in *Rhizophora* and *Bruguiera*, or the Mangroves properly so called. In some of the spurious Mangroves, as *Avicennia* and *Ægiceras*, a lesser degree of development takes place, and in general their pericarpia remain entire till they have dropped from the tree. In both cases the final cause of the economy is sufficiently

ciently evident; a greater than ordinary evolution of the embryo being necessary to ensure its vegetation in the unfavourable circumstances in which it is unavoidably placed.

But an analogous structure exists in other plants, where the final cause is less apparent, as in certain species of *Eugenia*, in which the integument of the seed is completely absorbed before its separation from the parent plant, and while the pericarpium remains entire.

An economy no less remarkable than that of the Mangroves, but of a nature diametrically opposite, takes place in the bulb-like seeds of certain liliaceous plants, especially of *Pancratium*, *Crinum* and *Amaryllis*; in some of whose species the seed separates from the plant, and even from the pericarpium, before the embryo becomes visible. This observation respecting some of these seeds was, I believe, first made by Mr. Salisbury; and in such as I have myself examined, I have found the fact connected with one no less interesting, namely, an unusual vascularity in the fleshy substance.

I have in another place*, in speaking of this substance, which constitutes the mass of the seed, and in a central cavity of which the future embryo is formed, stated it to be destitute of vessels, and entirely composed of cellular texture. But on a more careful inspection, of those seeds at least in which the separation precedes the visible formation of the embryo, I now find very distinct spiral vessels:—these enter at the umbilicus, ramify in a regular manner in the substance of the fleshy mass, and appear to have a certain relation to the central cavity where the embryo is afterwards formed, and which, filled with a glairy fluid, is distinctly visible before the separation of the seed. It is a curious consequence of this tardy evolution of the embryo, which in some cases does not

* Prodr. Flor. Nov. Holland. p. 297.

become

become visible unless the seed be placed in a situation favourable to germination, that very different directions may be given to its radicular extremity, according to circumstances which we have it in our power to regulate.

There is a fourth kind of anomaly in the structure of certain seeds, which, as I have formerly described it*, I shall here notice in few words. It is that which takes place in certain *Aroideæ*, especially in some species of *Calladium*. In these, the nucleus of the seed is not properly a monocotyledonous embryo, but has an appearance and economy more nearly resembling those of the tuber of a root; for, instead of being distinguishable into a cotyledon, a plumula and radicula, and of germinating in a determinate manner and from a single point, it is composed of a mass whose internal structure is uniform, and on the surface of which frequently more than one germinating point is observable.

None of these anomalies appear to me materially to lessen the importance of the characters derived from the seeds of plants; but they evidently render a minute attention to every circumstance absolutely necessary in all attempts either to deduce affinities or establish genera from this source; and they especially demonstrate the necessity of carefully ascertaining the state of the unimpregnated ovarium; for, while its structure remains unknown, that of the ripe fruit can never be thoroughly understood.

* Prodr. Flor. Nov. Holl. p. 335.

EXPLA-

A

C

2

B

D

E

Widdrington sc.

EXPLANATION OF PLATE VII.

A.—A branch of the panicle of LEONTICE THALICTROIDES *Linn.* (Caulophyllum thalictroides *Michaux*), of the natural size.

B.—The same magnified, to show at 1, the early rupture of the ovarium, the ovula as yet but little enlarged and only in part protruded: at 2, the same parts in a more advanced state; one seed being nearly ripe, supported by its elongated and thickened umbilical cord; a second ovulum considerably increased in size, but abortive; and the remains of the ruptured ovarium somewhat enlarged.

C and *D.*—Two longitudinal sections of the nearly ripe seed; exhibiting the vascular cord continued from the axis of the funiculus umbilicalis to the apex of the seed; the remarkable process of the inner integument at the umbilicus (of which another view is given separately at *E*); and the unripe embryo nearly in contact with this process, and as yet undivided.

XIII. *Remarks on two Genera of Plants to be referred to the Family of the Rosaceæ, in a Letter from Mr. A. P. De Candolle, Professor of Natural History in the Academy of Geneva, Corresp. R. Acad. Sc. Paris, &c. to Sir James Edward Smith, President of the Linnean Society.*

Read April 2, 1816.

Monsieur,

Si les descriptions des espèces nouvelles sont les acquisitions les plus évidentes de la botanique, les rectifications des descriptions anciennes ne laissent pas d'avoir aussi quelqu'intérêt : elles en acquièrent surtout lorsqu'elles sont rélatives à des plantes que leur beauté a rendues populaires, et lorsqu'elles ont pour résultats de faire classer avec quelque précision des objets connus auparavant ; ce sont ces motifs qui m'engagent à vous faire part de quelques observations sur le *Corchorus japonicus* de Thunberg, et le *Tigarea bidentata* de Pursh ; je vous en dois l'hommage à d'autant plus juste titre que vous avez déjà étudié le même sujet, et que c'est à la complaisance avec laquelle vous avez bien voulu me permettre d'étudier l'herbier de Linné, que je dois d'avoir pu éclaircir une partie importante des difficultés qui m'arrêtoient.

Occupé depuis plusieurs années de quelques recherches sur les fleurs doubles, j'avois analysé avec soin le *Corchorus japonicus* de nos jardins, et je m'étois assuré, 1. que dans cette plante les pétales naturels et les pétales accessoires qui représentent les étamines sont

sont insérés non sur le réceptacle comme dans les vrais *Corchorus*, mais sur le calice même ; 2. que l'ovaire n'y est pas unique comme dans les *Corchorus*, mais composé de 5 à 6 ovaires distincts; 3. que le mode de végétation et d'inflorescence de ce prétendu *Corchorus* diffère beaucoup des autres espèces de ce genre : j'avois conclu de ces observations que le joli sous-arbrisseau cultivé dans nos jardins sous le nom de *Corchorus japonicus* n'appartient ni au genre ni à la famille où il a été placé, mais qu'il fait partie de la famille des *Rosacées.*

Depuis lors j'ai eu, graces à vous, Monsieur, l'occasion de voir ce prétendu *Corchorus* à fleurs simples, et je me suis assuré que les soupçons déduits de l'analyse des fleurs doubles étoient fondés, et que cette opinion, quoique en apparence nouvelle aujourd'hui, se trouve déjà consignée dans plusieurs livres.

Vous avez déjà fait connoître par une notte de l'excellente monographe des *Rubus* que vous avez insérée dans la Cyclopædia du Dr. Rees, que le *Rubus japonicus* de Linné n'est autre chose que notre *Corchorus;* Linné dit que les fleurs en sont blanches, et cette circonstance a sans doute éloigné les botanistes de toute recherche à cet égard ; mais l'échantillon de l'herbier de Linné que vous avez bien voulu me permettre d'étudier, montre des pétales pales et décolorés il est vrai, mais qui ont pu être jaunes ; il est probable que Linné, entrainé par le sentiment et le tact exquis qu'il avoit sur les rapports naturels, a cru qu'une plante si voisine des *Rubus* et des *Spiræa* devoit avoir la fleur blanche ; cet échantillon avec celui de Thunberg ne m'a laissé comme à vous aucun doute sur l'identité des deux plantes, et sur la sagacité avec laquelle Linné l'avoit rapportée à sa famille ; en voyant même les rapports de foliation des *Rubus corchorifolius*, *elongatus*, *pyrifolius*, *acuminatus*, &c. avec celle de notre plante, on conçoit facilement comment sur un échantillon sec elle a pu être rapportée à ce genre.

Le savant et respectable Président de la Société Royale, qui, comme on sçait, a fait une attention particulière à la botanique du Japon, m'a fait remarquer lorsque j'ai eu l'honneur de lui parler de cet objet, que les Japonois paroissent avoir senti le rapport de leur plante avec les *Rosacées*, car ils donnent au *Pyrus japonica* le nom de *Buke*, et au prétendu *Corchorus* celui de *Jamma Buki*. Kæmpfer dit même en décrivant cette plante, "*flore simplici luteo Ranunculi, Rosæ caninæ facie ac magnitudine;*" depuis l'époque de Thunberg les premiers doutes sur la légitimité de sa classification se trouvent consignés dans le *Botanist's Repository;* la figure représente très bien la position perigyne des étamines et le nombre des ovaires; on lit de plus dans la description; *all the flowers that we have seen are from* 5- *to* 8-*gynous; which with the singular form of the capsule makes us consider it as a very doubtful species of Corchorus.*

S'il est facile d'affirmer que le *Corchorus* de Thunberg n'est point de ce genre, et qu'il appartient, comme Linné l'a pensé, à la famille des *Rosacées*, il l'est un peu moins de décider sa place dans cette famille; il ne peut être un *Rubus*, parceque ses fruits ne paroissent nullement destinés à devenir charnus, et que d'ailleurs son port et la couleur même de sa fleur s'y opposent trop fortement; il paroit avoir plus de rapports avec les *Spirées;* mais il s'en éloigne encore par l'unité des graines de chaqu'ovaire et par cette même couleur de la fleur; je crois donc que cette plante doit former un genre nouveau; j'aurois voulu pouvoir faire hommage de cette espèce élégante, et qui devient tous les jours plus populaire au botaniste qui m'a donné l'occasion de m'assurer de ses caractères, et qui a tant contribué à populariser la botanique en Angleterre: mais votre nom étant déjà consacré dans la science des fleurs, j'ai donné à ce nouveau genre le nom de *Kerria*, d'après celui de William Kerr, jardinier, qui d'après le témoignage de M. Robert

Robert Brown a introduit en Europe un très grand nombre de plantes de Chine, et auquel nous devons en particulier celle qui nous occupe.

Il est un autre végétal rapporté par le seul botaniste qui l'a décrit à une famille très différente de celle-ci, et qu'on doit selon moi non seulement rapporter à la famille des *Rosacées*, mais placer très près du *Kerria*; je veux parler du *Tigarea tridentata* de Pursh; dès l'inspection de la figure et de la description, j'avois pensé que cette plante n'étoit point un *Tigarea**, n'appartenoit point aux *Dilleniacées* dont le *Tigarea* fait partie, et devoit être reporté dans les *Rosacées* auprès des *Spiræa*. M. Lambert, qui a bien voulu me permettre d'étudier les richesses de sa belle collection, m'a donné l'occasion de changer ce soupçon en certitude; je puis donc d'après l'examen de l'échantillon même de Pursh affirmer que sa plante est un genre de *Rosacée*, que je désignerai sous le nom de *Purshia*, en l'honneur du botaniste qui l'a le premier fait connoître, aussi bien qu'un grand nombre de plantes de l'Amérique septentrionale.

Le *Kerria* et le *Purshia* ont entr'eux des rapports très intimes; l'un et l'autre sont des sous-arbrisseaux de pays tempérés et analogues†, munis de bourgeons écailleux, et dépourvus d'épines et d'aiguillons; leurs feuilles sont simples, alternes, dentées, rapprochées sur de petits rameaux latéraux; leurs fleurs naissent le plus souvent solitaires, et pedonculées au sommet de ces petits rameaux; elles sont composées de 5 pétales jaunes arrondis, attachés au calice, et d'un grand nombre d'étamines perigynes; leurs ovaires

* Le *Tigarea* d'Aublet est lui-même un genre qui a été supprimé et réuni au *Tetracera* par Willdenow.

† Les botanistes savent qu'il existe un grand nombre de genres, et même de ceux qui sont composés d'un petit nombre d'espèces, qui ont une partie de leurs espèces dans l'Amérique septentrionale, et l'autre dans l'Asie orientale: tels sont les genres *Magnolia, Illicium, Cimicifuga, Panax, Platanus, Thuya*, &c. &c.

ne renferment qu'une seule graine, et leur fruit n'est pas charnu : ces deux genres se placent donc assez-bien entre la tribu des *Spirées* et celle des *Dryadées.*

Malgré l'intimité que ces deux genres présentent dans l'ensemble de leurs caractères, et la possibilité qu'on soit un jour forcé de les réunir, j'ai cru qu'il étoit plus convenable de les considérer comme distincts ; leurs différences, quoique legères, me paroissent suffisantes pour autoriser cette séparation : 1. Le *Kerria* a toujours de 5 à 8 ovaires au moins ; le *Purshia* n'en a qu'un d'après Pursh. M. Robert Brown y a vu 2 ovaires dans une fleur qu'il a analysée ; je n'en ai vu qu'un dans celle que j'ai observée ; ainsi le nombre, quoiqu'un peu vague, est fort inférieur à celui du *Kerria.* 2. La graine du *Kerria* est attachée latéralement vers le milieu de l'ovaire ; celle du *Purshia* est attachée à sa base. 3. Les styles du *Kerria* à fleur simple sont longs, filiformes, bien distincts des ovaires, tandis que celui du *Purshia* est court, et semble n'être qu'une simple sommité d'ovaire retrecie et atténuée ; oserai-je même ajouter que les ovaires sont glabres, peut-être *indehiscens* dans le *Kerria*, velus et susceptibles d'une legère dehiscence dans le *Purshia*; que le *Kerria* a des stipules axillaires très distinctes, tandis que celles du *Purshia* manquent; ou que du moins, si elles existent, elles y sont très petites et à peine perceptibles ?

D'après ces considérations, je crois pouvoir établir les caractères de ces deux genres, comme suit :

Kerria.

Rubi Sp. Linn. *Corchori Sp.* Thunb.

Car. Calyx 5-fidus, lobis ovatis, 3 obtusis, 2 apice calloso-submucronatis, æstivatione imbricatis : Petala 5 orbiculata calyci inserta, ejusdem lobis alterna : Stamina circiter 20 filiformia calyci inserta : antheræ ovatæ : Ovaria 5-8 libera glabra globosa, ovulo

ovulo unico lateraliter adhærente fœta : styli totidem filiformes. Capsulæ (ex Thunb.) globosæ.

Veg. Suffrutex inermis ramosus cortice lævi virescente, ramulis lateralibus brevibus è gemma squammosa ortis, floribus in ramulis sæpiùs solitariis pedunculatis; folia ovato-lanceolata acuminata penninervia grossè dentata, dentibus serratis serraturis acutis subaristatis, Spirææ opulifoliæ nervatione et vernatione similia : stipulæ 2 lineari-subulatæ rigidiusculæ : flores lutei facillimè pleni, staminibus in petala oblonga obtusa basi angustata substipitata mutatis, ovariis elongatis effœtis sed sæpius persistentibus nec omnino evanidis.

Kerria Japonica.

T'eîto vulgo Jamma Buki. *Kæmpf. Amœn.* 844.

Rubus Japonicus. *Linn. Mant. p.* 245.

Corchorus Japonicus. *Thunb. Fl. Jap.* 227. *Bot. Rep. t.* 587. *Bot. Mag. t.* 1296.

Hab. in Japonia circa Nagasaki et alibi. *Thunb.* ♄ (v. v. c. fl. pleno. v. s. c. fl. simpl. in herb. Smith.)

Purshia.

Tigareæ Sp. Pursh.

Car. Calyx 5-fidus, lobis ovatis obtusis : Petala 5 orbiculata calyci inserta : Stam. circiter 20, calyci inserta : Ovarium 1 (2 ex Brown) ovato-oblongum pubescens apice in stylum brevem simplicem attenuatum, ovulo unico basi inserto : Capsula ovario conformis rima laterali dehiscens.

Veg. Frutex ramosissimus inermis, cortice cinereo, ramulis lateralibus brevibus è gemma squammosa ortis : folia in ramulis conferta basi cuneata apice grossè bidentata supra villosa subtus cano-tomentosa : stipulæ nullæ aut minimæ : flores pænè lutei.

Purshia

Purshia tridentata.
Tigarea tridentata. *Pursh Fl. Bor. Am.* 1. *p.* 333. *t.* 15.
Hab. in pascuis secus flumen Columbia in America boreali.
Lewis. ♄, (v. s. s. in h. Lamb.)

Je désire, Monsieur, que ces observations puissent vous offrir quelqu'intérêt, et en publiant cette note prise en grande partie dans votre Herbier et dans ceux des autres botanistes de l'Angleterre, je m'estime heureux d'avoir une occasion de les remercier publiquement, ainsi que vous, de l'accueil obligeant par lequel ils ont bien voulu faciliter mes recherches.

J'ai l'honneur d'être, Monsieur, avec la considération la plus distinguée, votre très humble et devoué serviteur,

A. P. de Candolle.

XIV. *A Synopsis of the British Species of Rosa. By Joseph Woods, Esq. F.L.S.*

Read April 16 *and June* 4, 1816.

The beauty of the Rose is so trite a theme, that it would be almost impossible to praise it in any other terms than have already been used for the same subject:—but beautiful as it is, the genus has long been involved in confusion and obscurity. Born with the same senses, the same tastes as other men, the botanist will feel its beauties even more strongly than they do, in proportion as those tastes and senses have been more exercised towards similar objects. But the difficulties attending the investigation of these plants are at least equal to the charms of their appearance and fragrance: even their commonness has perhaps contributed to our ignorance of them. Educated with Roses always before our eyes, it is long ere we learn to consider them as objects of science; and the excitement of novelty is lost while we are yet incapable of accurate examination. For my own part, if I had not been stimulated by the strikingly different appearance of the genus in the hedges of Westmoreland from that which it assumes in the southern counties, I should probably never have exposed my insufficiency in this attempt to discriminate the species: but the almost uniformly villous leaves and the colour of the flowers, generally either a white (sometimes almost pure, sometimes with a spot or two of full red), or else a much deeper red than in any of the Roses in the neighbourhood of London, attracted my attention,

tion, and urged my endeavours to find fixed and distinct characters, to distinguish plants marked by such differences in the general appearance. Though I feel that I have little reason to congratulate myself on the success of these attempts, and have indeed been successively obliged to relinquish many of the characters on which that general difference of appearance depends, yet I venture to offer their imperfect results to the notice of the Linnæan Society. In an obscure or intricate subject, the faithful record of observations is always valuable.

With views no more exalted, it may be considered as inconsistent to attempt a Synopsis of the British Roses; but in fact I did not perceive any other mode in which the remarks I had collected could be so well arranged; and the attempt once made, I exerted myself to give some consistency and value to the essay, by putting in systematic order the materials within my reach. That it is still imperfect I am aware; but I flatter myself it will not be found useless by the future investigator of this most interesting genus.

It appears to me that the principle to be attended to in the subdivision of genera, is to keep together those species which are most nearly allied in nature. In the formation of the genera themselves, it may be necessary to attend exclusively to the organs of fructification, as the most important parts of the plant; but in their sections we must find a character in any part which will keep similar plants together. With all this latitude of choice, the accomplishment of the object will be found often of very difficult attainment; and after all our labours, the best arrangement which can be made may still present some important aberrations.

On examining by this general rule the usual division of the genus *Rosa* into those "fructibus ovatis" and "fructibus subglobosis,"

sis," the following observations will sufficiently show that it is extremely defective. The existence of prickles, or rather of setæ, on the fruit or on the peduncle, will not serve for this purpose much better, though these characters have hitherto been much insisted on;—the setæ on the peduncle are, I believe, more constant than those on the fruit, but they are by no means implicitly to be depended on.

I have no intention, as I have no means, to enter in this essay on any examination of foreign Roses; but in endeavouring to form an arrangement of the British plants, it became necessary to pay some attention to the general appearances, and to the more striking characters of the foreign species. If the whole genus were spread out before a botanist, he would separate them, according to the habit or general appearance of the plants, into several leading divisions; but in proceeding to distinguish each of these families in description, he will feel the want of some precise language to discriminate certain peculiarities not yet sufficiently attended to. Indeed, in analysing the differences among any tribe of plants more minutely than has been done before, we shall probably find it necessary either to adopt new terms, or to use with more precision some to which a more lax or more general interpretation has been affixed. This privilege I have ventured to assume in a few instances, where it seemed to me indispensable; and particularly with respect to the arms (*arma* of Linneus) of the Roses, which have hitherto been called by the general term *aculei*, except in a few instances, where weak pedicellated glands have supplied their place; and this latter appearance has been designated by the word *hispid*. Something of the necessity of more accurate distinctions seems to have been felt by Sir J. E. Smith in his account of the genus *Rosa* in Rees's Cyclopædia, by his

his having used the words *aculeatus*, *setosus*, and *hispidus*, as applied to the fruit and peduncle; but he extends the difference no further, and has given no explanation of the particular meaning he attaches to these terms.

Roses are furnished with *aculei*, *setæ*, *glands*, *hairs*, *chaff*, and *pubescence*. Aculei or prickles are sometimes hooked, and generally more or less curved; but in some species they are quite straight. They have an expanded oblong base, and occur on the stems, petioles and nerves of the leaves, and perhaps in one or two instances on the fruit and fruit-stalk; at least one variety of *R. spinosissima* is either furnished with aculei, or with setæ so strong that they are very liable to be mistaken for aculei.

Aculei are either straight, as in *R. spinosissima*; straightish, with a very slight curve downwards, as in *R. villosa*; falcate, or bent as a scythe, as in the large prickles of *R. gracilis*, and in some varieties of *R. tomentosa*; and hooked or uncinate, like a claw or sickle, as in *R. canina*. Those of *R. arvensis* and of some neighbouring species are frequently a sort of obtuse elliptical cone, with a straight or curved mucro. This peculiarity of form is not found in *R. systyla*, and is no where sufficiently constant to enter into the character of any species. In the descriptions of the species, the form of the aculei must be taken from those which grow on the strong parts of the plant, and from those which are largest and with the most extended base.

Setæ are always straight, and tipped with a gland; this gland sometimes falls off, but vestiges of it can generally be perceived. Setæ are always smaller than aculei occupying the same situation; that is, the setæ of the stem are smaller than the aculei of the stem; the setæ of the petioles are smaller than the aculei of the petioles; but the setæ of the stem are often larger than the

aculei

aculei of the petioles. Setæ are found on the same parts as the aculei, and are besides frequent on the peduncle and fruit, and sometimes on the leafits of the calyx: they differ, in being longer or shorter in proportion to the size of the gland by which they are terminated.

The Glands of Roses are almost always on little footstalks, which however being weak, and seldom of length greater than the diameter of the gland, may in general be distinctly separated from the setæ above mentioned.

Glands rarely occur on the stems; but they are found on the stipulæ, which are frequently fringed with them; on the petioles and nerves; in some Roses on the under, and in some also on the upper side of the leaf, and sometimes on the edges, tipping the serratures, or giving the appearance of secondary ones; on the fruitstalk, receptacle, and calyx. The latter part is not unfrequently furnished with setæ at the base, which, gradually diminishing in length and strength, pass insensibly into glands towards the termination of the phyllus. To these glands the odour of the leaves of Roses seems to be invariably owing. They are generally most abundant on the early and imperfectly-formed leaflets, and sometimes fall off or dry up towards autumn.

Some Roses are furnished with only one sort of these arms, others have two, others again all three. In some, one sort is confined to one or two parts of the plant, as the setæ of *R. villosa*; in others it occurs generally, as the setæ of *R. rubella*. Some species, as *Rosa Eglanteria*, proceed by almost insensible gradations in one part or other of the plant from hooked to straight prickles, to setæ, and to glands; others again, though furnished with all these, display them perfectly distinct. In some the aculei, though always distinct from setæ, vary very much in size and character;

in others, though somewhat different on different parts of the plant, yet on any given part they are nearly similar. Some further observations on this head will be found in the description of the surculi.

Some Roses in the place of setæ exhibit white HAIRS, weak, but not very fine: in *R. Borreri* the peduncle has sometimes weak setæ, sometimes these white hairs, and sometimes, though more rarely, a fine pubescence: hairs also occur on the upper side of the axillæ of the foliole, and occasionally also along the channel on the upper side of the petiole in most Roses; and sometimes the petioles and the nerves on the underside of the leaf are covered rather with hairs than with down; but from this point the hairiness passes insensibly into pubescence, with which it is even interchangeable. On the upper side of the leaf likewise a few straggling along the nerves may occasionally be observed in all the smooth-leaved Roses; the seeds also and the styles are generally hairy or villous. The weak white hairs occur in every part of the plant on which glands or setæ are found, being a production apparently of a similar nature.

CHAFF may be observed occupying the place of hairs at the axillæ of the folioles of *R. spinosissima* and some others of that tribe. I have not observed it elsewhere.

PUBESCENCE is found on the stems, receptacles, calyces, stipulæ, and folioles. The presence or absence of hirsuties, whether of coarse or fine hairs, on the petiole and on the veins beneath the leaf, appears to me of considerable importance, and it is observable that these always accompany each other. Individual leaves may doubtless be found in which the petiole is downy and the nerve naked, or perhaps sometimes just the reverse; but a more extended examination will assuredly demonstrate their connexion. To the pubescence of the inferior and superior paginæ of the leaf

attention must be paid, although the former perhaps always in some degree accompanies the hirsuties of the footstalk. On the stem, peduncle and fruit, pubescence is too rarely exhibited in British Roses for me to form any estimate of its value. On the other hand, *R. arvensis* is the only British Rose of which the styles are smooth, and the seeds in all of them are villous. The white hairs which occupy the place of glands are always more or less interchangeable with them; the hairs on the axillæ of the leaflets, and those which are occasionally to be met with along the upper surface of the midrib, are I believe common to all Roses, and can therefore be of no use in distinguishing the species. The chaffiness is only met with in one tribe, where it is somewhat uncertain, and which is besides characterized by much more important distinctions.

The appropriate name for the HIP of a Rose during the inflorescence has been long a subject of contention among botanists; a circumstance which may be considered as a proof of the insufficiency of the Linnæan terminology in this respect. Linnæus himself called it the *germen*. Sir J. E. Smith, aware of the impropriety of this term, drew all his specific characters of this part from the fruit, not adverting to its appearance in an earlier stage: in the detailed description he still preserves the word *germen*. Willdenow continues the use of this word, although he censures Linnæus for adopting it. Jussieu and Gærtner call it simply *calyx*, describing the genus as having *calyx urceolaris*. The French botanists call it the *tube of the calyx*: but, according to general apprehension, the calyx would consist merely of those five leaves which form the outer envelope of the flower; and even after a strict attention to botanical terms, a student would be apt to conclude the fleshy body separated by its substance, and apparently

by

by its functions, from the five small leaves, to be a *germen*, till the circumstance which alone distinguishes it—the small orifice through which the styles pass—is pointed out to him. Under these circumstances I have ventured to call the part in question a *receptacle*, understanding by this term the thickened substance occurring between the summit of the peduncle and the leaves of the calyx in the natural order of *Rosaceæ*, supporting not only the latter, but also the stamina and petals, and confining it to the period of inflorescence:—the outer covering of the flower I have therefore exclusively called *calyx*, and its divisions *leafits* instead of laciniæ.

The only objection to this arrangement arises from that part of a strawberry and of one or two other genera, which has usually been called *receptacle*. Considering this term as only applied to the edible part of the strawberry, Gærtner says that the Rose has no receptacle: the difference, however, seems to me only this, that the inner series of vessels in the receptacle is dilated into a spongy body; in *Fragaria* soft and juicy; in *Comarum* harsh and dry; while in *Rosa* and *Potentilla* no such expansion takes place. If this be a correct view of the subject, the fruit of the strawberry ought not to be considered as the true receptacle, but as a spongy body attached to the receptacle and immediately supporting the seeds.

In calling the calyx simple, sub-simple, or compound, I have perhaps taken a less excusable liberty with the common language of botany;—by *simple*, I mean to express that the leafits are undivided or without any offsets. These offsets of a leafit when they occur have the appearance of a proliferous growth, which renders the term *offset* particularly applicable; and the term would perhaps be better than that of *pinnæ*, which I have adopted, if

if it were as usual. In a regularly-formed calyx they are always very narrow at the point of junction, and go off at a considerable angle; and when they take their commencement from a wide base, or lie nearly parallel to the line of the leafit when the flower is open, the calyx must be rejected as a monster. On this subject some further observations will be found in the course of this introduction. This character (of a *simple* calyx), like all others in the genus, must be determined with caution; as even in some of those Roses whose calyx is generally simple, a small offset may sometimes be observed, even putting monstrosities out of the question. Another circumstance to be attended to is, that the proper offset or pinna always occurs before the contraction of the calyx leafit at the point of the flower; after that contraction many Roses have a strong tendency to produce more or less of a leaf.

The five leafits of the calyx of a Rose, united before the expansion of the flowers, present five lines of junction, each of which in the *compound calyx* is furnished with a row of offsets; two of the leaves having pinnæ on each side, one on one side only, and the remaining two are uniformly entire.

> " Quinque sumus fratres, sub eodem tempore nati,
> Bini barbati, bini sine crine creati,
> Quintus habet barbam sed tantum dimidiatam."

This arrangement I express by the term *compound:* in the *subsimple* calyx every flower offers one or more of these offsets, but the whole provision is never found in any one.

In all Roses these calyx leafits are liable to become monstrous two ways: sometimes one or two, or sometimes even the whole number will grow out into leaves (*folia*), and sometimes the offsets are entirely wanting even in species where they usually are the

the most numerous. In the first case the divisions mostly take place after the contraction of the leafit, which in the bud marks the termination of the petals; or if it occur in the lower and broader part, it carries the appearance of a division not of an offset, being wide at the base and contracted upwards; whereas the legitimate offset is uniformly contracted at the base and expanded upwards, except in the few instances where it is capillary. In the second case the receptacle is generally small, and the leaves are expanded towards the apex. In both the receptacle is but little contracted at the summit, and assumes somewhat of a turbinate form; but the best security for the student will be to examine many examples, and to judge by comparison of their proper form.

Another word, which perhaps may require some explanation,—rather, however, from a peculiarity in the mode of growth in this genus than from any singularity in the use of the term,—is Surculus. In many roses, perhaps in some degree in all, two appearances may be observed; and, if I may be allowed the expression, every species under different circumstances has two distinct habits. A seedling Rose of the family of *R. canina*, for instance, where this property is very remarkable, usually comes up a small and feeble plant; it soon puts forth branches, weak like the parent from which they sprung. The aculei are few, small, weak, and but slightly hooked; the flowers pale and solitary; or, if in a favourable soil, two or even three flowers may be seen together; and the plant for several years probably will not exceed the height of four or five feet. If in this state it be cut down, a strong shoot proceeds from the root or from the base of the stem, which in one year will rise eight or ten feet in height, armed with abundance of strong hooked prickles, whose base is nearly equal to their length;

length; and bearing in the following summer bunches of six or eight flowers; or in *Rosa surculosa*, which affords an excellent example of these modes of growth, perhaps even of twenty-four flowers. In *R. arvensis*, and still more in some foreign species of that tribe, these shoots frequently bear cymes in the same year in which they are produced; consisting in *R. arvensis* of fifteen or sixteen flowers; in *R. indica* of twenty or thirty; in *R. moschata*, as I am informed by my friend Mr. Borrer, who has taken the trouble to count them, sometimes as many as two hundred and sixty-five. As branches are yearly produced from these surculi, their strength diminishes, and the original character of the plant returns till new root-shoots make their appearance. These are produced when the plant is partially destroyed; nor do I know that they ever occur except in consequence of some injury to the original growth. They do not indeed always vary to the extent I have described; but they constantly differ in this manner from the other parts of the plant, though not in equal degree.

In the Latin descriptions no ambiguity can possibly occur from the use of the term "foliolum," as applied to the parts of the calyx and those of the leaf. In the English observations I have endeavoured to avoid confusion, by calling the first *leafit* and the latter *leaflet*, a distinction I did not adopt till I felt the want of it. The shape of the leaflet is taken principally from the terminal one, which I consider as the most perfect; all those of the earlier leaves are uncertain in their shape, always rounder than the others, sometimes retuse: these are to be rejected, and the shape of the leaflet deduced from those expanded later in the season.

The stipulæ of all British Roses are linear-decurrent on the petiole of the leaf, and generally edged with glands; in some

species these continue unchanged, or nearly so, in those leaves which accompany the inflorescence, and no stipulæ are found unaccompanied by leaves; in others the leaflets gradually diminish in number, till at last they are entirely deficient, and the two stipulæ unite and form a *bractea*; in others, again, before this process is complete, the stipulæ increase very remarkably in breadth, and the first bractea formed is perhaps subrotund, though arising from an alteration of strictly-linear stipulæ; but in the cymes of flowers the bracteæ are repeated, growing gradually smaller and somewhat narrower; still, however, retaining traces of their original increase in width. The description of the *bracteæ* is therefore taken from the usual form of the first, which are found entirely devoid of leaflets; and the circumstance affords a very good distinction between two tribes of Roses, the family of *R. cinnamomea* possessing them in a remarkable degree, which I therefore describe as *bracteatæ*; and those of the family of *R. spinosissima* preserving the stipulæ nearly unaltered, which I have therefore called *ebracteatæ*.

This appropriation of terms is not the only liberty for which I have to apologize in this essay. I must acknowledge that I have described plants as species, of which I can hardly say that I really believe them to be distinct; but when this is the case, it is because I did not know with what species to join them. In enumerating them as species, I hope likewise to provoke the attention necessary to rectify the error; while, if placed as varieties, they would have less chance of being attended to. Another circumstance in which I have deviated from the usual practice of British botanists, though in this I am supported by the authority of Willdenow, is, that I have given names to many of the most remarkable varieties; and this practice has been

adopted

adopted on the same principle of exciting the attention of other observers.

The drawing out into a table the specific characters of a genus possesses a double advantage; it brings them to a test, by which the writer will inevitably discover if unfortunately some of his specific characters should be drawn up without including any peculiarities to separate it from others, a fault of which even good botanical works afford too many examples; and it is of great assistance to the future investigator, as it leads him step by step to the species which is the object of his examination. But in order to accomplish this end, it is necessary that the characters which are most important and most permanent should occupy the first places: it is desirable that the arrangement of the table should of itself divide the genus into its most natural families. To combine these advantages is no easy task. To discover characters which shall be permanent, always capable of clear description and determination, and which at the same time shall uniformly bring together the most similar plants, and separate those comparatively dissimilar, is perhaps beyond the power of the human mind. Mr. Brown's arrangement of *Proteaceæ*, in the tenth volume of the Society's Transactions, is an excellent specimen of what may be done in this way. Lamarck and De Candolle in their analysis of the genus *Rosa* in the *Flore Française*, have proceeded on a similar notion, though they have adopted a much inferior form, and seem to have had no higher ambition than to assist in some degree the investigation of the species. Even in this they have effected very little; because in taking first the colour of the flower, then the shape of the fruit, and then the prickliness of the peduncle, they have adopted for their leading divisions characters which are very variable. The

yellow-flowered Roses are perhaps constant in their colour; but this is by no means the case with the other species. The globular fruit in some divisions of the genus appears to be important; in others it is extremely uncertain. If the bristly fruitstalks are ever of any value, it can only be when they are used very cautiously to separate one or two allied species in particular subdivisions.

The characters which appear to me most constant in this genus are the presence or absence of setæ on the stems; the prickles straight or hooked, equal or unequal; the tendency towards the formation of the upper stipulæ without leaves, or at least with leaves of fewer folioles, and expanding into bracteæ. Next to these are the simple or compound form of the leafits of the calyx, and the simple or compound serratures of the leaves. In the latter subdivisions I have made use of the shape and flatness or hollowness of the leaflets; and sometimes, though unwillingly, I have been obliged to depend on the pubescence, not finding any other describable character to discriminate plants whose difference of habit seemed to announce the necessity of separation.

This arrangement is not without its disadvantages, principally on account of the deciduous nature of the setæ in two, or perhaps in three, families of the genus. Of these, however, *R. cinnamomea* is the only British plant; and a moderate attention to the description will easily teach the difference between this plant and *Rosa villosa*, the only species with which a specimen devoid of setæ is in danger of being confounded.

ROSA.

ROSA.

Character Genericus.

Receptaculum carnosum urceolare, fauce contractâ.
Calyx 5-phyllus paullum infra faucem receptaculi insidens. *Foliola* plus minus triangularia, tomentosa, æstivatione imbricata.
Petala 5, obcordata, disco faucis receptaculi basi angustissimâ affixa, venosa.
Stamina plurima, disco receptaculi affixa.
Germina numerosa, superficiei internæ receptaculi affixa; inferiora pedicellata. *Styli* tot quot germina per faucem receptaculi transeuntes. *Stigmata* obtusa.
Fructus: Receptaculum auctum baccatum, semina includens.
Semina numerosa, angulosa.

Observation.

I have already explained the reasons which have determined me to consider the young fruit of the Rose as a receptacle. In the abortive attempts to produce flowers, which so frequently occur in *Rosa sulphurea*, this part is flat as in *Potentilla*. In *R. turbinata* and a Rose called *R. caroliniana* in the gardens about London, it is cup-shaped; and sometimes even in our single English Roses a tendency to this form may be observed, but never without being accompanied by other circumstances of monstrosity.

In addition to the above characters, it may be observed, that all British Roses have weak stems furnished with prickles; pinnate leaves with serrated leaflets; and linear stipulæ generally furnished with glands on the edges, decurrent on the petiole of the leaf.

Synopsis Specierum.

A. Setigeræ (aculeis sæpius rectis)
- 1. bracteata, setis deciduis . . . . . *cinnamomea.*
- 2. subebracteatæ, setis persistentibus
  - α. serraturis simplicibus
    - a. fructu suburceolato, aculeis paucis subæqualibus . *rubella.*
    - b. fructu globoso, aculeis confertis valde inæqualibus . *spinosissima.*
  - β. serraturis serrulatis
    - a. foliis supra glabris . . . . . *involuta.*
    - b. foliis utrinque hirsutis
      - * laciniis calycinis integris
        - † aculeis rectis . . . . . *Doniana.*
        - †† aculeis falcatis . . . . . *gracilis.*
      - ** laciniis calycinis divisis . . . . . *Sabini.*

B. Setis nullis, aculeis rectiusculis
- 1. calycibus simplicibus . . . . . *villosa.*
- 2. calycibus subsimplicibus
  - α. bracteis ellipticis . . . . . *scabriuscula.*
  - β. bracteis lanceolatis . . . . . *heterophylla.*
- 3. calycibus compositis
  - α. serraturis serrulatis
    - a. petalis margine crenatis . . . . . *pulchella.*
    - b. petalis margine integris . . . . . *tomentosa.*
  - β. serraturis simplicibus . . . . . *nuda.*

C. Setis nullis, aculeis uncinatis
- 1. stylis distinctis
  - α. serraturis serratis
    - a. foliolis hirsutis
      - * pagina tota inferiore glandulosa
        - † aculeis confertis, surculorum inæqualibus . *Eglanteria.*
        - †† aculeis sparsis, surculorum subæqualibus . *micrantha.*
      - ** pagina inferiore subeglandulosa.
        - † pinnis calycinis confertis latissimis . . *Borreri.*
        - †† pinnis calycinis raris angustissimis . . *cæsia.*
    - b. foliolis glabris . . . . . *sarmentacea.*
  - β. serraturis simplicibus
    - a. foliolis subtùs venulis hirsutis
      - * pagina superiore hirsuta
        - † bracteis fructum superantibus . . . *bractescens.*
        - †† bracteis fructu brevioribus . . . *dumetorum.*
      - ** pagina superiore glabra
        - † aculeis subæqualibus . . . . *collina.*
        - †† aculeis inæqualibus . . . . *hibernica.*
    - b. foliolis utrinque glabris
      - * aculeis petiolorum falcatis . . . . *canina.*
      - * aculeis petiolorum uncinatis . . . . *surculosa.*
- 2. stylis unitis
  - α. surculis suberectis; aculeis confertis . . . . *systyla.*
  - β. surculis decumbentibus; aculeis sparsis . . . *arvensis.*

1. Rosa

1. Rosa cinnamomea.

R. bracteata, receptaculis globosis, calycibus simplicibus, caulibus setigeris, foliolis lanceolato-oblongis simpliciter serratis.

R. cinnamomea. *Linn. Sp. Pl.* i. 703. *Willd.* ii. 1065. *Eng. Bot.* xxxiv. *t.* 2388. *Lam. et Dec. Flore Fr.* iv. 439.

Frutex quinquepedalis. *Rami* vagi, atropurpurascentes, setis tenerrimis deciduis, aculeisque rectis, sub-binato stipularibus muniti. *Petioli* tomentosi, inermes. *Stipulæ* lineares, undulatæ, purpureæ, glanduloso-serratæ; eæ quæ floribus propiores foliis deficientibus in bracteas latissimas acuminatas immutatæ. *Foliola* 7, par superius et foliolum impar ceteris majora, omnia lanceolata, molliter pubescentia, quod præcipuè in paginâ inferiore accidit; supra cinereo-viridia, subtus pallidiora. *Pedunculi* 1 ad 3 bracteas superantes, glabri. *Receptaculum* globosum, glabrum, fuscum. *Calycis foliola* simplicia, elongata, petalis longiora, inermia, margine tomentosa. *Flores* [cyathiformes rubescentes *Sm.*] *Styli* planiusculi. *Fructus* globosus [aurantiacus *Sm.*].

Found by R. A. Salisbury at Aketon pasture near Pontefract. *Smith* in *Eng. Bot.*

R. cinnamomea of Roth's *Fl. Germ.* i. *p.* 217, and ii. 554, appears to be *R. lutea β bicolor.* The above description was taken from a garden specimen (with single flowers), for which I am indebted to my friend Mr. Borrer. On comparison we found it to agree exactly with the figure and description of *English Botany.* Willdenow quotes *R. fluvialis Fl. Dan. t.* 868, as a variety of this plant; but this appears to me very doubtful. *R. colliniola* Ehr., *R. majalis* Hermann., and *R. fœcundissima* of some German writers, are usually, and I believe rightly, considered as synonyms of this species; but I have not had sufficient opportunity of investigation to decide upon the subject: and Roth describes *R. fœcundissima* with hooked prickles; which certainly causes considerable doubt. Perhaps, too, we must place here *R. fraxinifolia* of Gmelin, *Fl. Bad. Alsat.* ii. 413.

The long leaflets with simple serratures would alone be sufficient

cient to distinguish this from every other British Rose; indeed it belongs to a family of which we have no other example in these islands, distinguished principally by setose stems, straight prickles, globose germens, entire calyx leafits, lanceolate or oblong leaflets, and large distinct bracteæ. The setæ and even the aculei are very apt to be deficient on the upper part of the plant; and in this intricate genus it is necessary to examine the whole plant, and even many individuals of the species wherever it is possible. In all parts of the plant the setæ are apt to fall off entirely; but the little papillæ, to which they were originally attached, are in general observable. This family includes *R. Banksiæ* and *R. blanda*, and perhaps we may unite with it *R. parviflora*, *R. nitida*, *R. lucida*, *R. gemella*, *R. Lyonii*, *R. setigera*, *R. caroliniana*, and *R. caucasica*, of the catalogue in Rees's Cyclopædia, to which I refer, as the work of a botanist of the highest authority, and as the most complete list of the genus hitherto published. I must, however, take this opportunity to declare that my knowledge of the foreign Roses is exceedingly slight and confined; and that in this attempt to mark the subdivisions of the genus, I have drawn my notions of the plants almost entirely from the characters given in the above-mentioned work. The object of these enumerations is to make my ideas intelligible respecting the natural affinities of the several species. In all this tribe the setæ are deciduous, and the aculei few and nearly equal, never passing by almost insensible gradations into setæ, as they do in *Rosa spinosissima*, *R. involuta*, &c.

This plant having hitherto been observed only in one place in these islands, I have no British varieties to enumerate. In countries where it is plentiful it varies very much in appearance, if we may judge from the different names it has received, and the discordant opinions as to what ought to be included in it as varieties.

2. Rosa

2. Rosa rubella.

R. ebracteata, caulibus setigeris, receptaculis suburceolaribus, serraturis foliolorum simplicibus, aculeis perpaucis gracillimis subæqualibus.

R. rubella. *Eng. Bot.* xxxvi. *t.* 2521.

Frutex erectus, 3—4-pedalis; in sabulosis maritimis vix sesquipedalis. *Rami* breves, fusci, aculeis rectiusculis, gracillimis, setisque confertis instructi. *Petioli* glandulosi, foliorum ad ortum superne subacerosi, cetera nudi. *Stipulæ* lineares, margine glandulosæ, subæquales. *Foliola* 7 ad 11 paria, quorum duo vel tria summa ejusdem cum foliolo impari magnitudinis, reliqua sensim minora; omnia elliptica, obtusa, simpliciter serrata, utrinque glabra, supra viridiora, subtus pallidiora. *Pedunculi* solitarii, filiformes, setis longiusculis tenerrimis vestiti. *Receptaculum* basi globosum, superne aliquantulum urceolatum; nunc glabrum, nunc setis sparsis instructum, atrorufum, nitidum. *Calycis foliola* triangularia, subulata, simplicia, setosa. *Flores* rubelli, aut interdum rubri, vel variegati. *Styli* inclusi; stigmatibus planiusculis. *Fructus* subglobosus, superne receptaculi instar ad formam urceolatam accedens [coccineus, *Sm.*].

Mr. Winch finds this species on the sands of the sea-shore in Northumberland, mixed with *R. spinosissima*: it is also said to have been brought from Scotland. The ripe fruit I have never seen.

The resemblance of *R. rubella* to *R. spinosissima* may perhaps have occasioned it to have been so long overlooked; though the stems and branches covered with setæ, intermixed with a very few slender aculei, sufficiently distinguish it. The simple serratures of the leaflets will not suffer it to be confounded with *R. involuta* or *R. Doniana*.

The specimen of *R. pimpinellifolia* in the Linnæan Herbarium considerably resembles this species; but it is not sufficiently perfect to enable me to pronounce with confidence: I have therefore preserved the name given to it in English Botany. Perhaps some other authors may also have intended this plant by *R. pimpinellifolia*; but I have not been able to unravel their synonyms from those of *R. spinosissima*.

Rosa rubella is an interesting species, as it is so exactly between the families of *R. alpina* and *R. spinosissima*, that it might almost indifferently be referred to one or the other. The aculei are few and frequently wanting, as in the former tribe; the setæ, though not uniformly deciduous, are yet very apt to fall off; and the fruit, though not properly urceolate, is distinguished from that of *R. spinosissima* and its affinities by a very evident neck. Of the family of *R. alpina* we have no British Rose; it includes besides that species *R. pendulina*, *R. lagenaria*, and *R. pyrenaica*.

Mr. E. Forster has a plant raised from seeds which were sent from Ireland for *R. hibernica*, and which, if not a distinct species, must be referred to *R. rubella*. The receptacle during the inflorescence is very long, and the leaves of the calyx are furnished with small offsets. The prickles are extremely slender, and more curved than is usual in the tribe, and the leaflets are narrower than their general form in this and the following species. There is a specimen closely resembling it in the Banksian Herbarium, where it is referred to *R. pimpinellifolia*, and marked *Hort. Pitcairn.* 1781.

3. Rosa spinosissima.

R. ebracteata, caulibus setigeris, receptaculis globosis, serraturis foliolorum simplicibus, aculeis confertis valde inæqualibus.

R. spinosissima. *Linn. Sp. Pl.* i. 705. *Fl. Brit.* ii. 537. *Eng. Bot.* iii. *t.* 187. *Willd.* ii. 1067. *Roth's Fl. Germ.* i. 217. ii. 555.

R. pimpinellifolia *β*. *Lam. et Dec. Fl. Fr.* iv. 438.

R. pumila spinosissima, foliis pimpinellæ glabris flore albo. *Raii Synop.* 455.

Frutex erectus, in apricis bipedalis, quandoque in umbrosis multo elatior. *Rami* breves, interne fusci, aculeis reclinatis vel horizontaliter patentibus, rectiusculis, confertis, valde inæqualibus, tandem in setas immutatis, muniti. *Petioli* nunc glabri, sæpius glandulosi, interdum aculeis rectis instructi, acerosi, rarius pilosi. *Stipulæ* lineares, glanduloso-serratæ, glabræ, æquales. *Foliola* 7-11, foliolum impar, et paria duo superiora reliquis majora, inflorescentiam versus subpauciora, simpliciter serrata, hic illic serratura

ratura minore, plerumque glabra, interdum pilis raris ad nervum instructa, saturate viridia, nitoris expertia, subtus pallidiora. *Pedunculi* solitarii, superne incrassati, glabri. *Receptaculum* globosum, glabrum. *Calycis foliola* triangulari-lanceolata, acuminata, simplicia, petalis breviora. *Flores* planiusculi, petala alba, basi lutescentia, rarius pallide rubescentia, vel venis rubescentibus, vel alba gemmâ rubellâ. *Styli* inclusi; stigmatibus planiusculis. *Fructus* glaber, globosus vel depressus, nitidus, atro-purpureus, demum niger, interdum etiam maturus, sanguineus.

In borders of fields and bushy places in a gravelly or sandy soil; frequently abundant on sand-hills by the sea-shore.

In old specimens growing in barren and exposed situations, the branches are occasionally destitute of prickles. The flowers are sometimes red, and sometimes with veins of that colour. I have a specimen of the latter variety, gathered near Cartmell in Lancashire, with elliptical acute folioles. In the *R. ciphiana* of Sibbald they are variegated with red and white.

"The ripe fruit is in some countries preserved, and brought to table in that state. In its natural state it is every where eaten by children. It has a grateful sub-acid taste. The juice of it diluted with water, dyes silk and muslin of a peach-colour; and with the addition of alum, of a deep violet: but it has very little effect on woollen or linen." *With.* ii. 465.

β. Fruit-stalk rough, with pedunculated glands. The flowers are sometimes very large.

R. pimpinellifolia α. *Lam. et Dec. Fl. Fr.* iv. 438. Sussex, Mr. Borrer.

γ. *aculeatissima.* Fruit very large; peduncles and fruit sometimes smooth, sometimes armed with aculei rather than setæ: both appearances may be seen on the same plant: the fruit is generally attenuated at the base. Sussex, Mr. Borrer.

R. pimpinellifolia γ. *Desvaux Journ. de Bot.* ii. 119.

δ. *pusilla.* Peduncle very short; fruit large, depressed, almost buried among the leaves. Ireland, Mr. Sabine.

ε. Peduncle setose; fruit somewhat ampulliform, dark. Found by Mr. Robertson near Newcastle. I have never seen any specimen: it may perhaps be a dark-fruited variety of *R. rubella*.

R. spinosissima may be easily distinguished from *R. involuta* by its simple serratures. The only other British plant with which it could be confounded is *R. rubella*; but in *R. spinosissima* the aculei are numerous, strong, and expanded at the base, and gradually diminish into setæ, those of an intermediate size being as numerous as those which are larger or smaller. In *R. rubella* the prickles are few, very slender, little expanded at the base, and nearly of a size; while the setæ are much more numerous and crowded than in *R. spinosissima*: the setæ of the peduncle also in *R. rubella* are long and slender; whereas the peduncle of *R. spinosissima* is either naked as in α, or with the glands on short peduncles as in β, or with arms, which are rather aculei than setæ, as in γ. But perhaps the existence of such variations in this species ought to induce us to place but little dependence on this character. Both the colour and shape of the fruit of *R. spinosissima* vary considerably; but it is probably never either so red or so long as in *R. rubella*.

R. myriacantha, *Lam. et Dec. Fl. Fr.* iv. 459, & vi. 533, appears to be allied to *R. spinosissima*; but the footstalk and the under surface of the leaves are covered with glands. Lamarck and Decandolle also mention that there is a difference in the serratures of the leaves and in the leaves of the calyx, but they do not point out in what it consists. Desvaux, *Journal de Botan.* ii. 118, says the serratures of *R. myriacantha* are compound; but in a specimen of this species from Decandolle, in the Herbarium of Mr. D. Turner, they are simple.

I am by no means confident that the figure in the *Fl. Danica*, *t.* 398, is intended for this plant: it differs in the aculei, which

are

are represented as all equal; and being variously bent, look rather like hairs than prickles: their length, however, gives them a different appearance from those of *R. rubella*, and I have never observed smooth fruitstalks on that species. In all the Roses of the *Flora Danica* there is an unnatural curvature and laxity of habit, which was probably introduced by the artist from the notion that it would render them more beautiful as drawings.

No small degree of confusion has arisen between the names of *R. spinosissima* and *R. pimpinellifolia*, originating apparently with Linnæus himself. In the *Flora Lapponica* he says of *R. sylvestris pomifera minor*, which has usually been considered the same as *R. spinosissima*, "In desertis passim prope tuguria vel fluviorum ripas obvia fuit, licet nullibi copiose." In the *Flora Suecica* he describes a species under that name, with a reference to the *Sp. Plant.* but not to the *Flora Lapp.*, and says of it, "Habitat ad agrorum margines, eorumque acervos passim." Again, in the *Fruticetum Suecicum* (*Amœn. Acad.* v. 220,) he writes, "Per totam Sueciam crescit, præcipue in acervos lapidum et ad agrorum margines, adeoque in sabuletis et montibus." In the second edition of the *Sp. Plant.* i. 703, *R. pimpinellifolia* is first introduced, "germinibus globosis, caule aculeis sparsis;" and it is added, "Habitat forte in Europa:" but no synonyms are given. In the same edition *R. spinosissima* is described "germinibus ovatis glabris, pedunculis caule petiolisque aculeatissimis;" and in the *Syst. Veg. edit.* 13, the character "germinibus globosis" is equally given to both.

Sir J. E. Smith considers the specimen of *R. pimpinellifolia* in the Linnæan Herbarium as undoubtedly *R. spinosissima*; and very naturally concludes, that when Linnæus added *R. pimpinellifolia*, he did not recollect the plant to which he had previously given another name. Dr. Wahlenberg, *Fl. Lapp.*, quotes *R. spinosissima* of *Fl. Suec.* of Linnæus, but with a mark of doubt, as a synonym

of

of his *R. majalis*, of which he declares, "Rami ramulique in maturo frutice sæpius toti inermes, rarius aculeis stipularibus paucis rectis gracilibus armati." The principal, or rather, I believe, the only ground on which this reference is supported is, that the place of growth of *R. majalis* agrees with that pointed out by Linnæus for *R. spinosissima*, and that no other Rose grows in similar situations.

Dr. Afzelius, in his *Tentamen primum de Rosis Suecanis*, *p.* 3, remarks, "that Linnæus himself was at last inclined to unite *R. spinosissima* with *R. pimpinellifolia*; but that in earlier times he certainly was of a different opinion: because *R. pimpinellifolia* is not a native of Sweden, much less is it a plant growing 'ad agrorum margines eorumque acervos passim;' nor has it soft fruit. Therefore," continues he, "we cannot doubt that Linnæus at first intended some other species, which he afterwards seems to have forgotten; at first substituting in its place a Rose 'germinibus ovatis,' and afterwards confusing both with *R. pimpinellifolia*." A little further on, Dr. Afzelius adds, that from an examination of the places pointed out by Linnæus, it appears clearly that the species of *Rosa* called by him *spinosissima*, is one of the many varieties of *R. cinnamomea*. "Itaque," he proceeds, "hæc erit *R. spinosissima*, Linn. prima et vera, quæ circa Upsaliam et alibi crescit locis indicatis, est frutex parvus surculis caulibusque junioribus spinosissimis, et fructus maturos habet rotundos molles, dulces, rubidos." This account, if I understand it right, agrees with that of Dr. Wahlenberg: but if this is the case, some difficulty is introduced by the expression "caulibus junioribus spinosissimis;" as the young stems of *R. cinnamomea* are sometimes densely covered with setæ, and in the usual language of botany, as applied to Roses, might be called *rough*; but it seems a considerable license to call them *thorny*. Another unfortunate circumstance with respect to this passage is, that we do not know

know what *Rosa* Dr. Afzelius means to indicate by the name of *R. pimpinellifolia*; and still less is it possible to conjecture what is the *Rosa* "germinibus ovatis," which was according to him first confounded by Linnæus with *R. spinosissima*, and afterwards with that species blended into *R. pimpinellifolia*: but I have only been able to procure the first, second, third, fifth, sixth, seventh, eighth, ninth, and tenth of his *Tentamina*; in the last of which he resumes the consideration of this species, as described in the works of the Swedish botanists previous to Linnæus, and no further. Perhaps, if I had been able to consult the eleventh *Tentamen*, I might have found all difficulties resolved. Be that as it may, the *R. spinosissima* of the Linnæan Herbarium is certainly the English plant, and no variety of *R. cinnamomea*. I can have therefore no doubt in retaining the name, which would be very reluctantly transferred to a plant almost without prickles or thorns.

Willdenow describes *R. pimpinellifolia* as distinct from *R. spinosissima*; as also does Gmelin, *Fl. Bad. Als.* ii. 415: but I cannot understand from either of them in what the difference consists, except in the "aculei sparsi," which is the essential character given by Linnæus, in opposition to the "aculei conferti" of *R. spinosissima*, and is retained by both these authors. Dr. Roth, *Fl. Germ.* i. 217, and ii. 556, seems to acknowledge his inability to ascertain the difference.

4. Rosa involuta.

R. ebracteata, caulibus setigeris, receptaculis globosis, foliolis duplicato-serratis supra glabris, aculeis confertissimis.

R. involuta. *Fl. Brit.* 1398. *Eng. Bot.* xxix. *t.* 2068.

Frutex erectus, 2—3-pedalis. *Rami* stricti, fusci, aculeis confertis, strictis, reclinatis vel horizontaliter patentibus, valde inæqualibus, tandem in setas immutatis, muniti. *Petioli* aculeis reclinatis instructi, glandulosi, sparsim pilosi. *Stipulæ* lineares, glanduloso-ciliatæ, subæquales, sed interdum eæ floribus propiores ceteris aliquantulum latiores,

latiores, et etiam in bracteas parvulas immutatæ. *Foliola* 9; par superius et foliolum impar ceteris majora, omnia elliptica, duplicato-serrata, subtus venulis hirsuta, supra glabra, nisi interdum nervo quandoque petioli instar pilis sparsis, glandulosa. *Pedunculi* solitarii, rarius binati, setis inæqualibus obsiti. *Receptaculum* globosum, atro-fuscum, setis ut pedunculus munitum. *Calycis foliola* triangulari-lanceolata, integerrima, petala plerumque æquantia, glandulosa, receptaculo pallidiora. *Flores* cyathiformes; petala obcordata, rubescentia, basi albida. *Styli* inclusi; stigmatibus planiusculis. *Fructus* globosus, setosus: maturi colorem nescio.

Scotland, principally on the western coast. Glen Lyon, Rev. J. Stuart, D.D. Isle of Arran, Mr. G. Don.

This Rose is easily distinguished from *R. rubella* and *R. spinosissima*, by the double serratures of the leaflets. From *R. Doniana* it is known with more difficulty; for though I have uniformly found the upper surface of the leaf without hairs in this species, with the exception already noticed in the description, and as uniformly pubescent in the other, yet I feel that it would be unwise to place an entire dependence on this character. Still, however, the expanded flower and comparatively scattered prickles of *R. Doniana* seem to denote an essential difference between the two plants. The root-shoots of *R. Doniana* are indeed very full of aculei, though less so than those of *R. involuta*; and it must carefully be observed as a general rule in the comparison of these and of all other species of *Rosa*, that we must draw the parallel between similar parts:—for instance, in the present case we must compare the strong surculi or root-shoots of *R. involuta* with the surculi of *R. Doniana*, and the branches of the one with the branches of the other; and not conclude that there is no difference if the surculi of *R. Doniana* are as thorny as the weaker branches of *R. involuta*; for in almost all Roses these strong shoots are decidedly more prickly than the rest of the plant.

If the distinctive character between this family of Roses and that of *R. cinnamomea* be drawn from the bracteæ, as I conceive must necessarily be the case, the young botanist may possibly be led by

by it to seek this species of Rose among the last-mentioned family; the permanence of the setæ, and their insensible gradation into aculei, which never occurs among that tribe, will serve to correct the error.

5. Rosa Doniana.

R. ebracteata, caulibus setigeris, calycibus simplicibus, foliolis duplicato-serratis utrinque hirsutis, aculeis strictis inæqualibus sparsis.

Frutex bipedalis; in sepibus Sussexiæ interdum etiam quinquepedalis. *Rami* subdiffusi, fusci, aculeis rectiusculis horizontaliter patentibus, inæqualibus, gracilibus, sparsis, tandem in setas immutatis instructi. *Petioli* villosi, glandulosi, atque interdum aculeis minimis muniti. *Stipulæ* lanceolato-lineares, glanduloso-serratæ, tomentosæ, subæquales, sed interdum eæ floribus propiores aliquantulum latiores, atque etiam in bracteas parvulas immutatæ. *Foliola* 7 vel 9, elliptica, inflorescentiæ propiora subpauciora, par superius et foliolum impar ceteris majora duplicato-serrata, utrinque villosa, eglandulosa. *Pedunculi* solitarii, cylindracei, setis inæqualibus muniti. *Receptaculum* globosum, fusco-viride, setis fortibus armatum. *Calycis foliola* subulato-lanceolata, elongata, simplicia, vel tantum hic illic laciniâ filiformi instructa, petala æquantia, villosa, setosa, receptaculo viridiora. *Flores* expansi; petala alba, obcordata. *Styli* inclusi, stigmatibus planiusculis. *Fructus* globosus, setosus: maturum non vidi.

Gathered by Mr. G. Don of Forfar, on the mountains of Clova, and by Mr. Borrer by the water of Leith near Collington, also near Albourn and Henfield in Sussex.

I am very happy in the name of this species to have an opportunity of commemorating Mr. G. Don of Forfar, whose ability as an indefatigable investigator of our indigenous botany is well known, unfortunately now exerted no more. Mr. Don first gathered this plant, and distinguished it from *R. involuta*: and it merits observation, that though he relied entirely on the habit of the plant, all his specimens agree precisely with the artificial character I have adopted. Besides the particular differences pointed out under *R. involuta*, Mr. Don observed that the present

species runs less at the roots than the other. This I have not had an opportunity of examining; but the roots of the Sussex plant appear to extend themselves considerably. The mode of growth is certainly much looser and more diffuse.

From *R. gracilis* this species is distinguished by its much smaller size, both in the whole plant and in each part; by its peduncles, almost invariably solitary, and by the total want of the large curved aculei so characteristic of that plant—From *R. Sabini* by the leafits of the calyx, which in that species are uniformly divided. No other British Rose can be confounded with it.

6. Rosa gracilis.

R. ebracteata, caulibus setigeris, calycibus simplicibus, foliolis duplicato-serratis, utrinque hirsutis, aculeis majoribus falcatis.

R. villosa. *Engl. Bot.* ix. *t.* 583. (excl. Syn. et Fig. fructus.)

Frutex 8—10-pedalis. *Rami* vagi, intense fusci, aculeati, setigerique; aculei majores falcati, subbinato-stipulares; minores recti, sparsi, setas formâ referentes et in has demum sensim transeuntes. *Petioli* villosi, glandulosi, aculeis parvis subfalcatis muniti. *Stipulæ* lineares, acuminatæ, glanduloso-serratæ, glabriusculæ, eæ floribus propiores latiores, et interdum, foliis deficientibus, in bracteas parvas ovatas acuminatas immutatæ. *Foliola* 7 vel 9, par superius et foliolum impar ceteris majora, omnia elliptica, duplicato-serrata, utrinque hirsuta, margine glandulosa, quod interdum etiam subtus in nervo, sed nunquam, ut credo, in superficie paginæ inferioris accidit. *Pedunculi* 1—3, plerumque binati, setis inæqualibus obsiti, hoc qui prior evenit erecto, illo graciliore, longiore, nutante. *Receptaculum* globosum, nunc setis pedunculi instar munitum, nunc totus glaber. *Calycis foliola* triangulari-lanceolata, petala æquantia; rarissime in his conspicitur pinnula filiformis. *Flores* subcyathiformes, petala obcordata, pulcherrime rubescentia, basi alba. *Styli* inclusi, stigmatibus hemisphæricis. *Fructus* globosus: maturum non vidi.

The specimen figured in English Botany was sent by Mr. Robson, probably from the vicinity of Darlington; and I have received it from the same place under the name of *R. villosa*. In 1808 I observed

observed one or two plants of this species at Pooley-Bridge in Cumberland; and again in 1814. At the latter time I likewise gathered specimens from a plant in the neighbourhood of Keswick: but as I have neither seen nor heard of it elsewhere, I conclude it to be a rare plant.

I can hardly have any doubt as to the correctness of the synonym I have quoted. In the Rose figured in *Engl. Bot.* the prickles on the stem, by their number, scattered disposition, and slenderness, appear to indicate what I have called setæ, or at least the small aculei approaching to setæ. This point established, it must belong to the setigerous tribe; and we have only to determine between *R. Doniana*, *R. gracilis*, and *R. Sabini*. Unfortunately the large falcate prickles, the strongest character of *R. gracilis*, are wanting; but this is a circumstance which I conceive may occasionally occur in a single specimen; while on the other hand the size and habit of the plant, the binate peduncles, and the form of the calyx-leaves, induce me to refer it to this species rather than to either of the others, and the place of its growth strengthens this supposition. I am much more confident that the plant of *Engl. Bot.* is not the *R. villosa* of Linnæus, or that of Hudson, or even of the *Flora Britannica*. The description "aculei caulini rariusculi" pointedly disagrees with the figure; and all authors unite in attributing to *R. villosa* "aculei sparsi;" and in this genus Linnæus, from whom the term is borrowed, opposes "sparsi" to "conferti," and uses it to express the comparatively small number of aculei. The term would therefore be quite inapplicable to this plant and to the figure in *Engl. Bot.*, supposing, as would necessarily be the case, the setæ (never before distinguished from the aculei) to be included under the same term. The figure of the fruit, in which the calyx is remarkably compound, appears to have been drawn from a different plant,

probably owing to none having been sent by Mr. Robson with his specimen.

Besides the marks enumerated under *R. Doniana* by which these species may be distinguished, the peculiar length, slenderness, and apparent weakness of the second peduncle of *R. gracilis* may be mentioned. From *R. Sabini* it may be known by the simple leaves of the calyx.

7. Rosa Sabini.

R. ebracteata, caulibus setigeris, receptaculis globosis, calycibus compositis, foliolis duplicato-serratis.

Frutex 4—6-pedalis. *Rami* vagi, fusci, aculeis sparsis, inæqualibus, rectis, tandem in setas immutatis muniti. *Petioli* villosi, glandulosi, aculeati; aculei minimi, recti. *Stipulæ* lineares, glanduloso-ciliatæ, eæ floribus propiores aliquantulum latiores, his folia interdum desunt et bracteæ parvæ ovatæ fiunt. *Foliola* 5 vel 7, quorum par superius et foliolum impar ceteris majora, omnia elliptica, duplicato-serrata, subtus venulosa, venulis hirsutis, interdum etiam nervo et margine glandulosa, superficie quoque superiore pilis sparsis hispidâ. *Pedunculi* 1—3, filiformes, setis inæqualibus obsiti. *Receptaculum* globosum, olivaceum, setis sicut in pedunculis munitum. *Calycis foliola* composita, pinnulis angustissimis, nec raro capillaribus setosa, glandulosaque. *Flores* rubescentes, expansi, magni. *Styli* subinclusi, stigmatibus villosis. *Fructus* globosus: qui sit in maturo color nescio.

Mr. Sabine received this Rose from Mr. Vere's garden, where it was introduced by Mr. Jackson from Scotland. Mr. Borrer found it in the neighbourhood of Dunkeld; and I have noticed it near Hawes-Water in Cumberland.

The setæ will always readily determine the family to which this Rose belongs, if examined on the living plant or in good specimens; but I know no way by which to determine with any certainty specimens of Roses exhibiting only the flowering shoot and two or three leaves. From all other British setigerous Roses *R. Sabini* is distinguished by the divided leafits of the calyx: the

segments

segments may I believe always be observed if examined with attention; but they are sometimes so strictly capillary as hardly to be distinguished from very large and long setæ.

This Rose does not seem to have been before noticed; I have therefore given to it the name of a gentleman who has long cultivated and investigated the characters, principally of the foreign Roses, with the greatest care. The result of his labours will not I hope be long withheld from the public. It is by his assistance that I am enabled to distinguish this species from all others.

This species and the five preceding form the English portion of the family of *R. spinosissima*. *R. rubella*, *R. spinosissima*, *R. involuta*, *R. Doniana*, *R. gracilis*, and *R. Sabini*, all agree in having persistent setæ on the stems and branches, the stipulæ not increasing in breadth towards the inflorescence, or only in a slight degree, the flowers few together, and the fruit nearly round. I have already mentioned how slight my knowledge is of the exotic species; and perhaps in this subdivision I have fewer materials of comparison than in any other; but considering that the more completely I exhibit my ideas on the subject of the arrangement of the genus, the better chance I have of making my principles understood, I venture to mention *R. kamschatica* as the only foreign addition to the tribe at present known.

8. Rosa villosa.

R. receptaculis subglobosis, calycibus simplicibus, aculeis rectiusculis subæqualibus, foliolis rhombeo-ellipticis, bracteis ellipticis.

R. villosa. *Linn. Herb.* *Linn. Sp. Pl.* i. 704? *Willd.* ii. 1069?
R. mollis. *Engl. Bot.* xxxv. *t.* 2459.
R. pomifera. *C. Gmelin Fl. Bad. Alsat.* ii. 410?
R. glandulosa. *Lam. et Dec. Fl. Fr.* vi. 539?
R. helvetica. *Römer's Arch. b.* i. *st.* 2. *p.* 6?

Frutex

Frutex 6—8-pedalis. ***Rami*** vagi, fusci, juniores glaucescentes, aculeati; aculei recti, graciles, subæquales, plerumque binato-stipulares. ***Petioli*** tomentosi, glandulosi, aculeisque parvis falcatis muniti. ***Stipulæ*** lineari-lanceolatæ, glanduloso-ciliatæ, eæ floribus etiam solitariis propiores latiores, et demum foliis deficientibus in bracteas late ellipticas acuminatas immutatæ. ***Foliola*** 5, rarius 7, par superius et foliolum impar ceteris majora, rhombeo-elliptica, duplicato-serrata, utrinque hirsuta, superne mollissima, subtus rugosa, et præcipue marginem versus glandulosa. ***Pedunculi*** 1, 2, setis inæqualibus armati, bracteas superantes. ***Receptaculum*** subglobosum, setis fortioribus, sed paucioribus quam quæ in pedunculo, munitum. ***Calycis foliola*** simplicia, triangulari-lanceolata, vix petala longitudine æquantia, glandulosa, setosa; fructûs reflexa. ***Flores*** concavi, saturate rubentes, rarius albi maculis sanguineis, vel rubescentes. ***Styli*** inclusi, stigmatibus convexis. ***Fructus*** globosus, setosus, ruber.

"Gathered by the late Mr. G. Jackson in Scotland, and by the Rev. Hugh Davies in Wales; also between Edinburgh and Ravelston-Wood. It appears to be not very uncommon in England and Wales." *Engl. Bot.*

The specimen in the Linnæan Herbarium marked *Rosa villosa* is undoubtedly this species, though the aculei are shorter, stronger, and more curved than I have generally observed them. It is probable that the plant of our gardens which is generally known by that name, and *R. tomentosa*, were included by Linnæus under the same species; but as the existing specimen agrees with the description, as far as that defines any one Rose, I have preferred assigning the name of *R. villosa* to this species, instead of retaining that of *R. mollis*, given in *English Botany*. We may be certain that Linnæus intended the present plant—that he would have included the others is matter of supposition; and when it is found necessary to subdivide an original species, the Herbarium is the best authority to determine which plant shall retain the name at first intended to include the whole. In this case a further argument arises from the uncertainty of the plant intended under this name by other authors, and our inability to distinguish most of them from the numerous varieties of *R. tomentosa*.

On

On examination of the original specimens of *R. mollis* in the Herbarium of Sir J. E. Smith, it appears to me that, of the places of growth mentioned in *Engl. Bot.* Mr. Jackson's only can be safely quoted for this species, and that the others belong to *R. tomentosa*, to which I must also attribute the "*Rosa sylvestris, folio molliter hirsuto, fructu rotundo glabro, calyce et pediculo hispidis*" of Dillenius in *Raii Syn.* 478. The Rev. Hugh Davies observes, that in the plants he finds, the fruit varies from perfect smoothness to every degree of roughness; but as *R. villosa* and *R. tomentosa* have been hitherto described "*fructu hispido*," and both species are liable to vary in that respect, I do not perceive that this observation can at all tend to determine the synonym. It is far more likely to be a smooth-fruited variety of *R. tomentosa* (which certainly occurs in Middlesex and Surrey), than the present species, which we have no reason to suppose was ever found in those counties.

I have drawn up the description of this plant from a specimen gathered in Mr. Vere's garden at Kensington, in September 1814, and from another gathered in Mr. Sabine's garden at North Mims in June 1815. These two plants proceeded originally I understand from the same root.

I have already observed, that in most of our Roses the earlier leaves of each sort are obtuse: this species seems to have a greater quantity of these leaves than most others.

A plant agreeing closely with these specimens is sold by Lee and by Loddiges under the name of *R. villosa*, except that the aculei are stronger and slightly curved, approaching therefore more closely to the plant of the Linnæan Herbarium: but though the general character of the aculei is of the greatest consequence, I do not find these minute differences much to be depended upon.

Though

Though very downy, the leaves of this Rose are generally green above; but I have specimens which are considerably gray. Mr. Sabine has a plant from Mr. G. Don, which differs from this only in a harsher pubescence.

β. *cærulea.* Fruit and peduncle nearly smooth; flowers blush-red. The glaucous waxiness of the young shoots is very conspicuous and very beautiful in this variety: the leaves are more glandular, the bracteæ are in general smaller, and the habit is more slender than in α. The plant from whence I have taken this account was sent from Scotland, by Mr. G. Jackson, to Mr. Vere's garden, and from thence received by Mr. Sabine; but I have specimens nearly similar collected by Mr. Robertson near Newcastle, and by Mr. D. Turner at Killin; and I have met with it myself in Friar's Wood, near Ingleton.

γ. *concavifolia.* Leaflets remarkably concave, or conduplicate and hoary. Bracteæ lanceolato-ovate; receptacle globose. Scotland, Mr. Borrer.

δ. *suberecta.* Fruit globose, that and the petiole furnished with strong setæ; flowers deep red. Stems stiff and upright; leaflets 7, sometimes 9, elliptic, concave; stem, petioles, stipulæ, young prickles, and midrib, of a vinous red. The general appearance of this variety is such as to make me wish to consider it as a distinct species; but I have not been able to fix on any good character. In smell, in the abundance of glands underneath the leaves, and even in habit, it approaches somewhat to *R. Eglanteria*; it is not however entirely free from the turpentine flavour which accompanies all

all this family; and the straight prickles render it impossible to mistake it for that species. If distinct, its place would be before *R. villosa*, as nearer to the family of *R. spinosissima*. The stipulæ are almost membranous, which would form an excellent character if it should be found constant. I have only seen it in one place, on a rocky limestone bank at Ingleton in Yorkshire; and at that time I was so puzzled by the multifarious appearance of the specimens I had collected, and which I had not had opportunity to arrange, that I did not pay it the attention it merited, and only preserved a single specimen.

It is with considerable doubt that I have quoted *R. pomifera*, *Fl. Bad. Alsat.*, as a synonym of this species. The author says, that sometimes two of the calyx-leafits are divided, which might have induced me to refer it to *R. scabriuscula*; especially as the name seems to indicate a large-fruited Rose; and the fruit of *R. scabriuscula* is occasionally very large; but in other respects it does not agree with that plant.

I hesitate still more whether *R. glandulosa*, *Lam. et Dec. Fl. Fr.* vi. 539, ought to be considered as a smooth variety of this plant: it certainly approaches very near to it, except in the pubescence.

Rosa helvetica, *Römer's Archiv. für die Botanik*, is perhaps a dwarf variety of this species. Here again the description "foliolis glabris inodoris" renders it very doubtful.

9. Rosa scabriuscula.

R. receptaculis ellipticis, calycibus subsimplicibus, bracteis ellipticis, aculeis rectiusculis subæqualibus, foliolis anguste ellipticis duplicato-serratis.

R. scabriuscula. *Engl. Bot.* xxvii. *t.* 1896. *Winch Bot. Guide*, ii. *Pr. p.* 5.

Frutex 4—6-pedalis. *Rami* vagi, fusco-olivacei, aculeati; aculei recti, gracilis omnis qui in situ eodem ejusdem fere magnitudinis, plerumque binato-stipulares, sed sparsi quoque inveniuntur. *Petioli* tomentosi, glandulosi, aculeisque minimis rectis muniti. *Stipulæ* lineares, glanduloso-ciliatæ, eæ floribus propiores latiores, et demum foliis deficientibus in bracteas ellipticas acuminatas immutatæ. *Foliola* 5 rarius 7, par superius et foliolum impar ceteris majora, elliptica, vel potius in meis speciminibus oblongo-elliptica, duplicato-serrata, utrinque hirsuta, mollissima, subtus præcipue marginem versus glandulosa. *Pedunculi* 1—3, setis debilibus plerumque armati, interdum toti glabri, bracteas longitudine subæquantes. *Receptaculum* ellipticum, nunc setis aliquot fortioribus quam quæ in pedunculo munitum, nunc glaberrimum. *Calycis foliola* subpinnata, triangulari-lanceolata, petala vix æquantia, glandulosa, fructûs erecta. *Flores* concavi; petala alba, maculis sanguineis gemmæ persistentibus. *Styli* inclusi, stigmatibus convexis. *Fructus* magnus, subglobosus, ruber.

Found by Mr. Winch in hedges in Durham and Northumberland. *Engl. Bot.* Banks of the Dee, and on the side of Loch Tay, Mr. G. Anderson. Friar's Wood, near Ingleton.

If I were not fortified by the authority of Sir J. E. Smith and of Mr. Borrer, I should hardly venture to describe as a distinct species a plant so nearly approaching to some varieties of *R. tomentosa*. The calyx-leafits, indeed, though always in some degree pinnate, are never, as far as I have observed, completely furnished with offsets on each division as they are in that plant. In this respect it varies exceedingly, approaching however nearer to the compound calyx of *R. tomentosa* than to the simple one of *R. villosa*. On this character, such as it is, the specific distinction must principally rest; for the shape of the receptacle and leaflets, though sufficiently distinct in some specimens, still varies so much in this tribe of Roses that I dare not place much reliance on it. Still less can I depend on the greenness and harshness of the pubescence, the characters by which this Rose is

more

more particularly pointed out in *Engl. Bot.*; as the specimens which I have received from Mr. Winch, the original discoverer, are hoary with a velvety down, and exceedingly soft on both sides—perhaps even more so than is usual in any other species; and those which I have gathered myself agree with them in this as in every other particular. Mr. Winch also in his *Botanist's Guide* describes the leaflets as densely covered with down. I have reason to believe that the plants gathered by Sir J. E. Smith near St. Edmund's Bury, which in *Engl. Bot.* are attributed to this species, rather belong to *R. tomentosa* ν of this essay. The extreme variableness of this latter species (the Rose I have had the most opportunities of examining under different circumstances) induces me however to attach very little importance to this peculiarity in the pubescence.

10. Rosa heterophylla.

R. receptaculis subglobosis, calycibus subcompositis, aculeis rectiusculis subæqualibus, bracteis lanceolatis.

Frutex 7—9-pedalis. *Rami* vagi, pallide fusco-olivacei, aculeati; aculei subfalcati 1, 2, v. 3 singula ad internodia caulis, plerumque ad basin foliorum. *Petioli* tomentosi, glandulosi, rarissime hic illic aculeo minimo recto muniti. *Stipulæ* lineares, acutæ, tomentosæ, glanduloso-serratæ, interdum pagina inferiore glandulosæ; eæ floribus proximæ vix ceteris latiores, quanquam interdum deficiant folia. *Foliola* 5 v. 7, par superius et foliolum impar ceteris majora, nunc elliptica, nunc forma obovato-oblonga, basi rotundata, insigniter variantia, duplicato-serrata, utrinque molliter hirsuta, glandulosa. *Pedunculi* 1 v. 2, nunc glabri, nunc setis inæqualibus obsiti, bracteas æquantes vel eas superantes. *Receptaculum* subglobosum, nunc glabrum nunc setosum, setis fortioribus quam quæ in pedunculo inveniuntur munitum. *Calycis foliola* pinnata vel subpinnata, petalis longiora, basi setosa, sursum glandulosa. *Flores* expansos non vidi; petala alba sanguineo-maculata. *Styli* inclusi, stigmatibus convexis. *Fructus* globosus.

Found by Mr. W. Borrer at Collington near Edinburgh, and elsewhere in that neighbourhood; also at Finlarig.

I do not find any description to which this Rose can be referred. It seems to be called *R. villosa* by the Scotch botanists; but that name being appropriated to another species, I have given to the present plant the name of *R. heterophylla*, expressive of a character which it usually presents, and which gives to it a certain peculiarity of habit when compared with any other British species.

The Roses most nearly allied to this are *R. villosa*, *R. scabriuscula*, and *R. tomentosa*. From the first and last of these a proper attention to the leafits of the calyx will distinguish it; and from *R. scabriuscula*, as well as from the two others, the remarkable shape frequently occurring in the leaflet, and the narrow bracteæ.

11. Rosa pulchella.

R. receptaculis obovatis, calycibus compositis, aculeis rectiusculis subæqualibus, petalis margine crenatis.

Frutex 1½—2-pedalis. *Rami* subflexuosi, erecti, fusci, aculeati; aculei subfalcati, graciles, subæquales, plerumque binato-stipulares. *Petioli* tomentosi, glandulosi, aculeisque gracilibus falcatis muniti. *Stipulæ* lineares, glanduloso-ciliatæ, pagina inferiore glandulosæ, eæ floribus propiores latiores, sed bracteam perfectam nondum vidi. *Foliola* 5 v. 7, par superius et foliolum impar ceteris majora, elliptica, concava, duplicato-serrata, utrinque hirsuta, subtus glandulosa. *Pedunculi* pauci, setis inæqualibus obsiti, stipulas proximas superantes. *Receptaculum* obovatum, glabrum. *Calycis foliola* pinnata, petalis breviora, glandulosa. *Flores* concavi, petala saturate rubentia, margine glanduloso-crenata. *Styli—Fructus:* Has partes non potui satis examinare.

On limestone banks at Ingleton in Yorkshire.

Like the foregoing, this Rose seems to have been unnoticed by preceding authors. It is easily discriminated by its crenate petals from all other British Roses: but this character it may be difficult to determine in the Herbarium, as the petals of Roses are apt to fall off, and when preserved generally shrivel very much in drying. The shape of the receptacle and the shortness

of

of the calyx-leafits appear also to be characters worthy of attention; but I have seen too little of it to be able to point out the variations to which it is most subject. The size and habit of the plant, the shape of the receptacle and that of the leaflets, will distinguish this from the common *Apple Rose* of the gardens; a species with which it would be ridiculous to compare it, were it not for the singular circumstance of the crenate petals—a character which, as far as my knowledge extends, is not to be met with in any other species of this genus.

12. Rosa tomentosa.

R. calycibus compositis, aculeis rectiusculis subæqualibus, petalis integerrimis, bracteis ellipticis, foliolis duplicato-serratis.

R. tomentosa. *Fl. Br.* ii. 539. *Engl. Bot.* xiv. *t.* 990. *Lam. et Dec. Fl. Fr.* iv. 440.

R. villosa. *Huds. Fl. Angl. ed.* ii. *p.* 219. *Lam. et Dec. Fl. Fr.* iv. 440. *Roth Fl. Germ.* i. 217. & ii. 556.

R. Reynieri. *Römer's Archiv. B.* i. *St.* 2. *p.* 7.

Rosa sylvestris pomifera major nostras. *Raii Synop.* 455.

Frutex 6—8-pedalis. *Rami* vagi, fusco-olivacei, aculeati; aculei rectiusculi, graciles, subbinato-stipulares: sparsi quoque hic illic inveniuntur. *Petioli* tomentosi, setosi, aculeisque leviter falcatis muniti. *Stipulæ* lineares, tomentosæ, glanduloso-ciliatæ, paginaque inferiore sæpius glandulosæ; eæ floribus etiam solitariis propiores latiores, et demum foliis deficientibus in bracteas ovatas acuminatas immutatæ. *Foliola* 5 v. 7, par superius et foliolum impar ceteris majora, elliptica, apice triangulari-acuto, utrinque tomentosa, duplicato-serrata, subtus nunc tota superficie, nunc margine, venisve tantum glandulosa. *Pedunculi* 1—4, setis inæqualibus obsiti, bracteis breviores. *Receptaculum* plus minusve ellipticum, subfuscum, setis laxius sparsis quam sunt calyx et pedunculus munitum. *Calycis foliola* triangulari-elliptica, acuminata, setosa, pinnata, pinnis inciso-serratis, glandulosis, foliolum semipinnatum, pinnam solitariam tantùm plerumque habet. *Flores* planiusculi; petala basi alba, margine integerrima, nunc intense rubella, sæpius rubescentia, nunc tota alba, nunc alba maculis sanguineis externe notata, gemma sanguinea. *Styli* inclusi, stigmatibus planiusculis vel parum convexis. *Fructus* late ellipticus, ruber.

Common

Common in hedges and bushy places throughout Great Britain.

I rely upon the shape of the leaflet and the entire margin of the petals, to distinguish this Rose from the *R. villosa* of the gardens, whose petals are crenate, a character pointed out to me by Mr. W. J. Hooker; and somewhat also on the smaller and less globular fruit: on the bracteæ, and on the shape of the leaflets, to separate it from *R. heterophylla*: on the entire margin of the petals, to mark it from *R. pulchella*; and on the very pinnate leafits of the calyx, to divide it from *R. villosa* and *R. scabriuscula*. The plant thus discriminated includes so many varieties, or perhaps species, that it is certainly the most intricate of the genus. It undoubtedly embraces the *R. villosa* of Hudson, and the *Rosa sylvestris pomifera major nostras* of Ray, which has usually been quoted as a synonym of *R. villosa*. I should also feel confident that it included the *Rosa villosa* of the *Flora Britannica*, if the learned author had not assured me that that description was drawn up from the plant commonly known under the name of *R. villosa* in our gardens:—that, however, we have no reason to suppose a native of this country, though perhaps in the present state of our knowledge we should find it difficult to trace it to any other.

The characters proposed by British botanists to distinguish *R. villosa* from *R. tomentosa*, viz. the small ovate fruit and hooked prickles, do not by any means regularly go together. The size and shape of the receptacle and fruit vary much, as may be sufficiently seen in the ensuing catalogue of varieties; and even under that appearance from which I have drawn my description, indeed on the same bush, they may be observed large or small, more or less elliptic, more or less covered with setæ, or quite naked. The average shape in α is however wider than in

some

some of the varieties; and perhaps ν and ξ, in which they are remarkably elongated, might be taken for the *Rosa tomentosa* of the *Fl. Br.*; and the figure in *English Botany* is not very different from those varieties. Ray, however, says nothing of the curved aculei of his *R. sylvestris fructu majore hispido*, the synonym quoted by Sir J. E. Smith; while, on the contrary, he describes the fruit of *R. sylvestris pomifera major* "fructus pyri parvi forma et magnitudine"—a description which appears exaggerated if applied to *R. tomentosa* η of this essay, but which agrees with that variety better than with any other; but perhaps still better with an appearance sometimes met with in *R. scabriuscula*. Ray adds "spinulis obsiti;" a description which altogether does not agree with any fruit I have seen; but which we may easily perceive cannot indicate the same thing as the "germen globosum" of Linnæus; especially if we consider that in this family the fruit is uniformly rounder than the immature receptacle. Hudson has merely joined the synonym of Ray to his *R. villosa* β, without adding any remark of his own to either variety. Lightfoot, *Fl. Scot.* i. 261, has added, that the fruit is black when ripe; a circumstance which renders his species very doubtful.

In such a labyrinth what is the course to be pursued? I have already mentioned in the account of *R. villosa*, that in the appropriation of that name I have followed the Linnæan Herbarium. *R. tomentosa* is therefore left for this; and as the name cannot reasonably be objected to in a genus where it is so difficult to find names at all characteristic, and as some of the varieties are already well known under this name, I cannot hesitate to preserve it. The synonyms above quoted do not appear to me at all doubtful as to the species; but I have not attempted the difficult, or rather impracticable, task of determining the correspondence

dence between my varieties and the varieties or species of preceding authors.

I have made several attempts to form such an arrangement of the varieties of this Rose as might keep together those plants whose natural character would point out the probability of their constituting distinct species, and separate those whose habit seemed to announce important differences. This attempt has failed; but I believe in the following list the order adopted is not far from a natural series. If the botanist who knows the species be able to assign to the specimens he collects their place among these varieties, my object will be attained.

I have here been obliged to use the word *hirsutus* rather than *setosus* to the arms of the peduncle and receptacle, in order to include the variety *o*, which has a downy peduncle without either glands or setæ, while yet it is characterized by a receptacle smoother than the peduncle.

β. differs from α only in having the upper pagina of the leaf entirely smooth. Ambleside, Westmoreland.

γ. Leaves smooth on both sides. By the road on the north side of Loch Tay, Mr. W. Borrer.

δ. has a rounder leaflet than α, with scattered hairs on the upper surface, and scattered hairs and glands on the under; the nerves on the underside of the leaf are thickly clothed with hairs somewhat spreading; petals white. The earliest flowers in this variety frequently have the leafits of the calyx entirely simple, nearly linear, and expanded at the end: the latter peculiarity, where it exists in a remarkable degree, though pointed out in *English Botany* as a character of the *R. mollis* of that work, appears to me a sure indication of an unnatural or imperfect state of inflorescence. Dunkeld, Mr. W. Borrer.

ε. Fruit

ε. Fruit subglobose; receptacle frequently elliptical; peduncles sometimes extending beyond the bracteæ, from one to eight or nine in a cyme; petals blush-coloured, white at the base; prickles falcate; leaflets very soft, without glands, except on the nerves and serratures. Near Newcastle, Mr. Robertson. Tunbridge Wells, Penshurst, Stoke Newington, and Ulverstone.

ζ. *hybrida.* The leaves of this plant are green, not white with down, hairy underneath, and rough with glands; receptacle as setose as the peduncle; aculei falcate. Pointed out to me by Mr. Sabine under the name of *R. hybrida.* I have observed a similar Rose near Keswick, and also in the neighbourhoood of Godstone in Surrey. Mr. Borrer has specimens much resembling it from Scotland, in which the receptacle is globose.

η. Receptacle large, olive-coloured, attenuated at the base, less setose than the peduncles; peduncles one to four, furnished with weak setæ; leaflets rough, with glands on the underside, except those on the young shoots which are very soft and downy; the aculei vary very much, some even on the strong stems being quite straight, while in general, even on the young branches, they are considerably curved; whereas in this genus the root-shoots have usually the prickles stronger and more curved than the branches. This variety of *R. tomentosa* bears a considerable degree of resemblance to two other very distinct species, *R. micrantha* and *R. Borreri*, and at the same time in general appearance is not very different from the variety ε; I have only seen three plants; two between Down and Holwood in Kent in July 1815, both of which at first sight I took for *R. micrantha*, until the thorns, which are never uncinate

uncinate as in that plant, and the downiness of the young leaves undeceived me; and one near Potter's Bar in Hertfordshire, in the autumn of 1814, which I supposed at that time to be *R. Borreri*. The latter had eight ripe fruit, having probably had at least twelve flowers in a cyme; on the others I could not find more than four.

ϑ. Receptacle elliptical, as setose as the flowerstalk; peduncles often longer than the bracteæ; leaves densely villous, glandular underneath. Sent by Mr. G. Don to Mr. Sabine under the name of *R. mollis*.

ι. *sylvestris*. Receptacle a long ellipsis, as setose as the peduncle; peduncle shorter than the bracteæ; aculei falcate; leaflets narrower than in α, slightly pubescent above, hairy and rough with glands on the under side; surculi dark purple. Received by Mr. Sabine from Mr. Donn of Cambridge.

κ. *canescens*. Receptacle broadly elliptical, nearly smooth; aculei slender, but slightly curved; leafits elliptic, oblong, concave, very soft, white, with down on both sides, glandular beneath. The calyx-leafits of this variety are very much divided, and have a strong tendency to grow out into leaves; in some of the early flowers they are, however, nearly simple, with only a few laciniæ, broad at the base, lying in a direction parallel to that of the leafits. Stock Gill and Kentmer, Westmoreland, and Pooley-Bridge, Cumberland.

λ. Receptacle broadly elliptical, somewhat attenuated at the base, less setose than the peduncle; aculei falcate; has much the habit of the following variety. Gathered by Mr. Borrer in Scotland in 1810.

μ. Peduncles as long or longer than the bracteæ; receptacle as setose as the peduncle, and generally somewhat attenuated at

at the base; offsets of the calyx-leafits remarkably short and broad; petals white with red blotches; leaves somewhat concave. Highlands, Mr. W. Borrer.

ν. Receptacle elliptical, attenuated at each end; peduncle longer than the bracteæ; aculei falcate; leaflets narrower than in *α*, with a few hairs above, hairy and glandular beneath like the variety *η*. This seems to have some affinity with *R. micrantha*, but in a different way. The principal peculiarities are in the long peduncles, in the aculei, which, though never uncinate as in *R. micrantha*, are yet more constantly curved than in most of the preceding varieties of *R. tomentosa*, and in the narrow leaflets. It sometimes approaches in scent to *R. Eglanteria*; and the first time I gathered it in this state I did not doubt that I had found the American sweet-briar, *R. suaveolens* of *Rees's Cyclopædia*. The upper surface of the leaves is sometimes almost smooth, at others quite soft and downy; both sides are occasionally densely pubescent. Near Henfield in Sussex, Mr. W. Borrer. Kent, Surrey, and Middlesex.

ξ. differs from *ν* only in the want of glands on the under surface of the leaves, excepting occasionally on the nerve. Like that variety it is sometimes almost smooth, sometimes densely pubescent. Near Durham, Mr. Robertson. Lancashire, Westmoreland, and Middlesex.

ο. incana. Receptacle elliptical, smooth; calyx-leafits downy, without glands; peduncle with only a few hairs; aculei falcate; young shoots purple-gray; leaflets narrower than in *α*, with a hoary pubescence, without glands; but the colour is less striking than that of the variety *κ*. Stipulæ also downy and without glands. Sent from Scotland by Mr. G. Don to

Mr. Sabine, in whose garden is the only plant I have ever seen.

Perhaps of these varieties ζ may be a distinct species; ϑ and ι may possibly form another; η a fourth; and ν and ξ a fifth; and ο a sixth: this would seem a very great multiplication of species, and it would be extremely difficult to find for them any specific characters. Another obstacle to considering these as six species, arises from the great number of other varieties, which after repeated examinations I found myself unable to class with any one of them, and of which the distinctions are nevertheless exceedingly trifling. I have therefore above detailed the account of these, in hopes of exciting the attention of some botanist whose talents and opportunities will enable him to do more justice to the tribe.

To some one or other of these varieties we must probably attribute the *Rosa mollissima*, Gm. *Fl. Bad. Als.*; but in a genus so intricate, and with descriptions so defective as have hitherto been given of the Roses, I find the difficulty exceedingly great of assigning the synonyms of preceding authors to the proper species, and utterly impossible to trace them to their corresponding varieties.

The description of *R. montana*, *Lam. et Dec. Fl. Fr.* vi. 532, would induce me to join it to this species; but Willdenow, *Sp. Pl.* ii. 1076, refers the original plant of Villars, which is quoted also by Lamarck and Decandolle, to a Rose with hooked prickles ("aculeis uncinatis"), and which would agree tolerably well with *R. Borreri*. Among these inconsistencies I pretend not to decide what Villars intended, or what plant was meant by the French and German authors.

R. fœtida, *Lam. et Dec. Fl. Fr.* vi. 534, may perhaps be *R. tomentosa* β; but the authors compare it at once with *R. collina* and

their

their own *R. tomentosa*, two very different plants. "Aiguillons un peu courbés" is a character hardly inconsistent with any variety of this plant; though in some they are frequently to be met with quite straight. The fruit is said to give a fœtid smell when rubbed; a quality I have never had the opportunity of observing.

To the same variety, or to γ, we may perhaps refer *Rosa andegavensis* of the same work, vi. 539. It agrees very well with the usual appearances of this species, except in the pubescence.

13. Rosa nuda.

R. receptaculis globosis, calycibus compositis, aculeis rectiusculis, foliolis simpliciter serratis.

Frutex 5—7-pedalis. *Rami* diffusi, e fusco glaucescentes, aculeati; aculei subæquales, rectiusculi, sparsi, vel binato-stipulares. *Petioli* nunc glabri nunc glandulosi, absque aculeis vel tomento; pili tamen, ad axillas foliolorum siti, sunt in hac specie perconspicui. *Stipulæ* lineares, apice serratæ, eæ floribus etiam solitariis propiores ceteris multo majores. *Foliola* 5 vel 7, par superius et foliolum impar ceteris majora elliptica, acute et irregulariter sed simpliciter serrata, utrinque glabra. *Pedunculi* pauci, breves, glabri. *Receptaculum* globosum, viride, glabrum. *Calycis foliola* divisa, pinnis integerrimis. *Flores* rubescentes. *Styli* vix inclusi, stigmatibus in conum collectis. *Fructus* globosus: maturum non vidi.

Near Ambleside in Westmoreland.

No Rose hitherto published can be quoted as a synonym of this species; or at least its most remarkable peculiarity, the union of straight aculei unmixed with setæ, with smooth leaves furnished only with simple serratures, has never been noticed. Perhaps, however, I shall hardly be considered justifiable in admitting it in the enumeration of species, since I have only one specimen, which was gathered without particular notice among others from the hedges on the side of the road between Ambleside and Clappersgate. Had I known with what species to join it,

it, it would not have obtained a place by itself: its nearest affinity is probably *R. tomentosa*, from which however the peculiarities above remarked separate it widely. The petiole and the midrib of the leaflets are usually of a reddish or purplish hue; and in these circumstances, and perhaps also in habit, it is somewhat allied to the *R. rubrifolia* of Villars. That Rose, however, claims a nearer affinity with *R. cæsia*; but I should suppose, from the descriptions I have met with, that the aculei are straighter and the serratures more simple than in that species.

This Rose concludes the account of the British Roses of this family, consisting of six species; viz. *R. villosa*, *R. heterophylla*, *R. scabriuscula*, *R. pulchella*, *R. tomentosa*, and *R. nuda*: it is characterized by the want of setæ on the stems; the stipulæ changing more or less into bracteæ; and by aculei nearly straight, or at least not uncinate.

14. Rosa Eglanteria.

R. fructibus obovatis, aculeis inæqualibus majoribus uncinatis, foliolis hirsutis subtus glandulosis duplicato-serratis.

R. Eglanteria. *Sp. Pl. ed.* i. 491. *Hudson*, 218. *Encycl. Méthodique*, 286.

R. rubiginosa. *Mant.* ii. 564. *Willd.* ii. 1073. *Flora Br.* ii. 540. *Engl. Bot.* iv. *t.* 991. *Lam. et Dec. Fl. Fr.* iv. 445. *Roth Fl. Germ.* i. 218. & ii. 558. *Jacq. Fl. Aust.* i. 31. *t.* 50.

R. suavifolia. *Fl. Dan. t.* 870?

R. sylvestris odora. *Raii Synops.* 454.

Frutex 4—7-pedalis. *Rami* suberecti, virides, juniores fuscescentes, aculeati; aculei valde inæquales, majores uncinati, minores rectiores, minimi rectissimi, sed nunquam ut credo in setas immutati; aculei majores interdum binato-stipulares, ceteri semper sine ordine sparsi. *Petioli* tomentosi, glandulosi, aculeis falcatis instructi: deficiunt setæ. *Stipulæ* lineares, glandulis tenerrime serratæ, vel potius ciliatæ, eæ floribus

ribus propiores foliis deficientibus in bracteas immutatæ, quarum forma incerta. *Foliola* 5 vel 7, par superius et foliolum impar ceteris majora, elliptica, suprà hirta, subtus pilis glandulisque odoriferis vestita, serraturis serrulatis glanduliferisque. *Pedunculi* 1—11, setis inæqualibus obsiti, quarum paucæ interdum faciem aculeorum æmulant. *Receptaculum* primitivum obovatum, cetera plerumque elliptica, omnia fusca, setis sparsis munita; setæ longiores fortioresque aculeos simulantes receptaculi ad basin inveniuntur. *Calycis foliola* triangulari-ovata, longius acuminata, pinnata; pinnæ lineari-lanceolatæ, glanduloso-dentatæ. *Flores* concavi; petala rubella. *Styli* inclusi; stigmata convexa, villosa. *Fructus* primitivus obovatus, ceteri obovati vel elliptici, omnes setis fortibus basi armati, rubri, demum maturitate sanguinei.

In bushy places on a dry soil in Kent, Sussex, and Surrey. Sometimes very abundant on the chalky banks in those counties.

β. is a variety in which the larger aculei are falcate, not uncinate; and which seems to want the character arising from the increased magnitude of the setæ at the base of the germen. This may possibly be a distinct species.

The only Rose of our country which can be confounded with this is *R. micrantha*; and occasionally, when the latter grows in exposed situations, or when *R. Eglanteria* is found (which is rarely the case) in moist hedges, the eye will not immediately distinguish them. In general, however, *R. Eglanteria* is a stiff, compact, upright bush; *R. micrantha*, a loose straggling briar. In all cases the central flower of the cyme, the one which is first expanded, is followed by an obovate or pyriform fruit in the former species; while in the latter the fruit is at most only elliptical, and almost always terminating in something of a neck,—a distinction first pointed out in *Engl. Bot.*, and well marked in the figures of the two plants. Another equally constant character is derived from the aculei, which in *R. micrantha* are in general merely binato-stipulary, with a few others scattered without order on the branches —all nearly of a size, and never intermixed with a multitude of

smaller

smaller ones. In *R. Eglanteria* the aculei of the shoots, and frequently those of the branches, are mixed with scattered prickles of all sizes; though in small specimens this character may sometimes be wanting. In both species a few setæ may occasionally be noticed on the stem immediately below the inflorescence; but these seem to be merely accidental.

Mr. Borrer found a Rose in Normandy nearly allied to this, and most resembling the variety β; and Mr. Hooker brought specimens of the same from the South of France; but it has not been described by the French botanists, or at least I cannot appropriate to it any of their descriptions.

This Rose has been very unfortunate in its name; it is called *eglantina*, *eglentina*, and *esglentina*, by Bauhin and the early botanists. Linnæus in his first edition of the *Species Plantarum* called it *R. Eglanteria*; but in the second he transferred that name to the single yellow Rose, still however quoting the same synonyms, all of which clearly belong to this plant. And this species is not given, nor does the name of *R. rubiginosa* occur, until the publication of the *Mantissa Plantarum altera*: indeed it seems as if Linnæus at one time confounded the two species, misled merely by the circumstance of the glandular and fragrant leaf, which is almost the only character not common to the whole genus, in which these two Roses agree. Notwithstanding *R. rubiginosa* has been adopted by most of the modern botanists, I have ventured to restore the name originally given by Linnæus, in which I am supported by the authority of Hudson and of Poiret, *Encycl. Nat.* The yellow Rose, which is not a British plant, has latterly been more properly named *R. lutea*, from the hue, which is very rare in flowers of this genus.

15. Rosa micrantha.

R. fructibus ampullaceo-ellipticis, aculeis aduncis subæqualibus, foliolis hirsutis subtus glandulosis duplicato-serratis.

R. micrantha. *Engl. Bot.* xxxv. *t.* 2490.

Frutex 5—8-pedalis. *Rami* diffusi, virides vel fusco-virides, aculeati; aculei adunci, nunc sparsi, nunc binato-stipulares. *Petioli* tomentosi, glandulosi, aculeisque rectiusculis vel falcatis muniti. *Stipulæ* lineares, glanduloso-serratæ, interdum subtus glandulosæ, eæ floribus propiores solitariæ vix ceteris latiores, cymarum tandem foliis deficientibus in bracteas lanceolatas acuminatas immutatæ. *Foliola* 5 vel 7, par superius et foliolum impar ceteris majora, elliptica, duplicato-serrata, supra vix hirta, subtus pilis glandulisque odoriferis vestita. *Pedunculi* 1—11, setis obsiti, quarum nonnullæ, rarissime tamen, aculeiformes. *Receptaculum* ellipticum, fuscum, setis sparsis præcipue basi munitum. *Calycis foliola* glandulosa, pinnata, pinnis lanceolatis glanduloso-ciliatis. *Flores* cyathiformes, rubescentes. *Styli* inclusi; stigmata planiuscula. *Fructus* parvus coccineus, interdum ellipticus, sed sæpius plus minusve urceolatus.

Hedges and bushy places in the southern and midland counties.

This species was first established by Sir J. E. Smith in *English Botany*. Its closest affinity is certainly to *R. Eglanteria*; and I have already pointed out under that Rose the characters by which these species are best discriminated. I may add, that the present plant uniformly wants the strong setæ at the base of the fruit, which I have constantly found in *R. Eglanteria*, except in the rare variety β, which in most other respects assumes an appearance directly opposite to *R. micrantha*. The habit of this species is indeed so loose and straggling, that an inattentive observer might pass it over as a variety of *R. canina*. The fruit is always small, and never has the pear-shaped form of the primordial fruit of *R. Eglanteria*; the flowers are also generally smaller, but this is an uncertain mark. The scent varies exceedingly, being sometimes very weak, at other times not to be distinguished from that of *R. Eglanteria*, and once or twice I have observed the turpentine flavour which is generally to be perceived in

in the family of *R. tomentosa*. *R. micrantha* has also considerable affinity with *R. Borreri*: it may however be distinguished from that species by the much stronger and more numerous setæ of the peduncle generally extending on the fruit, by the narrower pinnæ of the calyx, and by the glands covering the whole under surface of the leaf; the general colour of the plant is also a paler and yellower green.

R. sempervirens, *Roth Fl. Germ.* i. 218. ii. 556; *R. umbellata*, *Lam. et Dec. Fl. Fr.* vi. 532, seems to be allied to this plant, but can hardly be identified either with this or with *R. Eglanteria*. It might be expected that the Rose mentioned in the account of *R. Eglanteria* as having been gathered by Mr. Borrer and Mr. Hooker in different parts of France, would be found among the descriptions of the French botanists; but I cannot refer it with confidence either to *R. sepium* or *R. umbellata*. If distinct, we may consider this subdivision of the large family of *R. canina*, distinguished by compound serratures and glands under the whole surface of the leaf, as composed of four species; *R. Eglanteria*, *R. micrantha*, *R. umbellata*, and one yet unnamed. I dare not at present admit *R. sepium* among the number.

16. Rosa Borreri.

R. receptaculis ellipticis, pinnis calycinis confertis, aculeis uncinatis subæqualibus, foliolis hirsutis eglandulosis duplicato-serratis.

R. dumetorum. *Engl. Bot.* xxxvi. *t.* 2579.

Frutex 6—10-pedalis. *Rami* diffusi, olivacei, aculeati; aculei uncinati, subæquales, plerumque stipulares, binati vel solitarii. *Petioli* tomentosi, glandulosi, aculeisque fortibus uncinatis muniti. *Stipulæ* lineares, glanduloso-serratæ, pagina inferiore haud glandulosæ, eæ floribus etiam solitariis propiores latiores, cymarum demum foliis deficientibus in bracteas ovato-lanceolatas acuminatas immutatæ. *Foliola* 7, intense viridia, lucentia, par superius et foliolum impar ceteris majora, impar quoque foliolis

paris

paris superioris semper latius; nunc ovato-elliptica, nunc rhombeo-elliptica, plana, duplicato-serrata, serrulaturis glandulosis, paginis ambabus plerumque hirsutis sed semper inferiore. *Pedunculi* 1—16, modo setis debilibus, nunc pilis albis sparsis, et nunc pubescentiâ densâ, instructi, bracteis breviores. *Receptaculum* ellipticum, obscure fuscum, glabrum. *Calycis foliola* triangulari-elliptica, composita, pinnis confertis, lanceolatis, vel ovato-lanceolatis, incisis, glanduloso-serratis. *Flores* incarnati vel rubescentes. *Styli* inclusi; stigmata planiuscula. *Fructus* ellipticus, rarius subglobosus, intense ruber.

Hedges and thickets, not uncommon.

β. Leaves hoary, with pubescence on both sides. Near Edinburgh, Mr. Borrer.

The leaves of this species are generally of a very dark colour, and always remarkably flat; the young leaves are tender at the edge, and frequently tinged with purple. This character it has in common with *R. dumetorum* and *R. surculosa*; but both these plants have simple serratures; and these marks, as well as the peculiar breadth of the terminal leaflet, may assist the investigator, in addition to the specific character and to the particularities already pointed out under *R. micrantha*, in distinguishing it from that species: from which, notwithstanding its affinity, it also strikingly differs in general habit. The irregularity of the serratures in *R. collina* may sometimes create a difficulty between this and that species. The calyx-leafits, the dark-green flat leaflets, and the broad terminal one, may help to decide in doubtful cases; yet some specimens I have been obliged to join to *R. Borreri* merely on account of the double serratures of the leaflets: and in the autumn of 1814 I observed a plant near Southgate, which, with all the other characters of *R. Borreri*, had nevertheless simple serratures: in 1815 the same plant had compound serratures. I have examined perhaps a hundred plants of this species, and my friends Mr. W. Borrer and Mr. E. Forster

probably as many more, without meeting with any other instance of such an anomaly; nor has a similar one been observed in any other species.

The artificial character which separates this from *R. cæsia* seems to be slight; yet it is I believe constant; and as there is no approximation in habit, there will be no difficulty in distinguishing the plants. No synonym of any foreign author can be referred with certainty to this species.

17. Rosa cæsia.

R. receptaculis ellipticis, pinnis calycinis raris, aculeis uncinatis subæqualibus; foliolis hirsutis eglandulosis duplicato-serratis.

Rosa cæsia. *Engl. Bot.* xxxiii. *t.* 2367.

Frutex densus, 5-pedalis. *Rami* suberecti, fusco-purpurei, glaucitie conspicuâ induti, aculeati; aculei uncinati, subæquales, plerumque binato-stipulares. *Petioli* tomentosi, glandulosi, plerumque inermes. *Stipulæ* lineares, glanduloso-serratæ, tomentosæ; eæ floribus etiam solitariis propiores latiores, et demum foliis deficientibus in bracteas ellipticas acuminatas immutatæ. *Foliola* 5 vel 7, par superius et foliolum impar ceteris majora, elliptica, venulis subtus prominentibus hirsutis; pagina inferiore hirsuta et interdum quoque superiore, serraturis glanduloso-serratis. *Pedunculi* subsolitarii, glabri, bracteis breviores. *Receptaculum* ellipticum, primo glaucitie indutum, dein fuscum, glabrum. *Calycis foliola* eglandulosa, lanceolata, acuminata, pinnata; pinnæ raræ, lineares, nunc glanduloso-dentatæ nunc integerrimæ. *Flores* rubescentes. *Styli* inclusi; stigmata hemisphærica. *Fructus* ellipticus: maturi faciem nescio.

At Taynuilt in Mid Lorn, Argyleshire; and in Strath Tay, between Dunkeld and Aberfeldie, Mr. Borrer. Side of Loch Tay, Mr. G. Anderson.

I have endeavoured in the description of *R. Borreri* to show the differences between that species and the present. *R. collina* is still nearer in character; and I fear that in the present state of our knowledge I can only point out the few and small pinnæ of the

the calyx-leafits as a decided mark of separation ; for the double serratures of the leaflets are sometimes rather ambiguous, and always less strongly marked than those of *R. Borreri*; and the simple serratures of *R. collina*, though I believe never strictly compound, are yet frequently so irregular and unequal as to produce something of the same appearance. From *R. hibernica R. cæsia* is artificially distinguished by the total want of the smaller scattered aculei. I have never seen this plant in a living state ; but Mr. Borrer assures me that the dense mode of growth, glaucous shoots, and hoary blueish gray foliage, contribute to give it an appearance very different from that of any other Rose.

Rosa rubrifolia of Villars, *Dauph.* iii. 549, seems intermediate between this species and *R. nuda.* Baron Fr. X. Wulfen, in *Römer's Archiv. fur die Botanik*, mentions a *Rosa glaucescens* which in some respects resembles this ; while in others it seems to unite better with *R. collina.*

The Rose with leaflets pubescent on the underside, mentioned by Afzelius in his *Tent. de Ros. Suec.* as confounded in Sweden with *R. canina*, is supposed by Sir J. E. Smith in *Engl. Bot.* to belong to this plant; it seems to me to be decidedly my *R. collina* β.

18. Rosa sarmentacea.

R. stylis distinctis, receptaculis ovatis, aculeis uncinatis, foliolis duplicato-serratis glaberrimis.

R. canina. *Roth Fl. Germ.* i. 218 ; ii. 560.

Frutex 8—10-pedalis. *Rami* diffusi, olivacei, aculeati ; aculei adunci, nunc rari, sparsi, nunc solitarii vel binato-stipulares. *Petioli* absque pubescentia, hic illic glandulosi, aculeisque falcatis basi expansis muniti. *Stipulæ* spatulatæ, glabræ, serratæ, serraturis interdum glanduliferis ; eæ floribus propiores etiam solitariis multo latiores, tandem foliis deficientibus in bracteas ovatas acuminatas immutatæ ; ad florum cymas bracteæ illæ numerosiores, sed basi angustiores. *Foliola* 5 vel 7, elliptica, par superius et foliolum impar ceteris majora, subacuminata, glabra, supra cerea, subtus interdum nervo aculeata,

aculeata, serraturis inæqualibus, plerumque divaricatis, irregulariter serrulatis. *Pedunculi* 1—8, glabri, bracteis breviores. *Receptaculum* anguste ellipticum, fuscum, glabrum. *Calycis foliola* glabra, triangulari-elliptica, acuminata, pinnis lanceolato-linearibus, inciso-serratis. *Flores* rubescentes, planiusculi. *Styli* inclusi, stigmatibus planiusculis. *Fructus* ellipticus, coccineus, nitidus.

Common in hedges and bushy places.

β. *nitens.* The leaves, instead of the gray waxy appearance they generally have, are of a shining green: this variety has frequently a few setæ on the fruitstalk. Mr. Borrer finds this character also in α. I have observed one specimen further remarkable by its straggling habit and small leaflets, with long ragged-looking serratures; perhaps it ought rather to be considered as belonging to the variety γ. In hedges.

γ. A dwarf variety of very lax and feeble growth, which is occasionally met with in waste ground and on way-sides: the leaflets are rarely more than five, elliptico-lanceolate, or even sometimes lanceolate; the serratures are narrower and longer. It is remarkable that in this variety, while the leaflets are always narrower than in α, the leafits are generally wider.

δ. is a very large plant, which has the fruit and even the immature receptacle nearly globose; the calyx-leafits are also frequently glandular. At Settle and other places in the mountainous district of the North of England.

ε A variety with very small flowers, and a habit not unlike that of *R. cæsia.* At Settle.

ζ. A large but slender plant, with flowers always solitary. Receptacle broadly-elliptical. Road-side near Furness Abbey.

I am disposed to refer to this species *R. micrantha, Lam. et Dec. Fl. Fr.* vi. 537. The name I have adopted is derived from the

the manuscript observations of Professor Swartz, communicated by him to Mr. Robertson of Newcastle.

The setæ which are occasionally met with on the peduncle of this tribe of Roses have a very different appearance from those of the straight-thorned Roses and of *R. Eglanteria* and *R. micrantha*; they are extremely feeble, hardly even stiff enough to support the gland by which they are terminated, and frequently passing into mere hairs without any gland: indeed in the former tribe the setæ seem to indicate an attempt to produce aculei; and it is sometimes difficult to say whether the latter name would not be more appropriate: in this they have the appearance of an endeavour to form hairs; and as they gradually diminish in strength and in the size of the terminating gland, till at last it entirely disappears, it is not always easy to decide to which sort of arms they belong. Thus, extraordinary as it may seem, we have in this genus hairs and prickles passing into one another by steps almost insensible.

The plant most nearly allied to this is undoubtedly *R. canina*, from which it is to be distinguished by its double serratures: by the smooth leaflets without either hairs or glands on the under surface, it may be easily known from *R. micrantha*; and the want of hairs will readily distinguish it from *R. Borreri* and *R. cæsia*; but as I am always unwilling to rest upon this character alone, when the difference of habit is supported by any other, I will observe that the shape of the leaflet, and its being always more or less carinate in this species, will be a decided mark of separation from the former of these plants; and the same character, though the difference is less distinctly marked, and the pinnæ of the calyx leafits, will make it known from the latter.

19. Rosa bracteſcens.

R. receptaculis globosis, aculeis uncinatis, foliolis simpliciter serratis subtus tomentosis, bracteis fructus superantibus.

Frutex 6—7-pedalis. *Rami* diffusi, nunc fusci, nunc olivacei, aculeati; aculei falcato-uncinati, binato-stipulares. *Petioli* tomentosi, nec glandulosi, aculeisque falcatis muniti. *Stipulæ* lineares, subintegerrimæ, vel apicem versus serrulatæ, subtus tomentosæ; eæ floribus propiores multo majores, demum foliis deficientibus in bracteas magnas ovatas, acuminatas, fructus superantes immutatæ. *Foliola* 5 vel 7, par superius et foliolum impar ceteris majora, elliptica, supra hirta, subtus tomentosa, interdum nervo aculeata, simpliciter serrata. *Pedunculi* 1—4, plerumque glabri, rarius setis sparsis debilibus armati. *Receptaculum* globosum, olivaceo-fuscum, glabrum. *Calycis foliola* triangulari-elliptica, pinnata, pinnis integerrimis. *Flores* incarnati, concaviusculi. *Styli* subinclusi; stigmata in conum porrecta, villosissima. *Fructus* globosus: maturi colorem nescio.

Hedges about Ulverston, Lancashire.

β. Stipulæ nearly smooth; calyx-leafits glandular. At Ambleside in Westmoreland.

I am not aware that this Rose, though presenting a very striking character, has been noticed by any preceding botanist: from that character the present name is adopted; but my choice was confined by the use of names previously introduced from characters somewhat similar. *R. bracteata* is the well-known name of a very different species; and Thuilliers has given the name of *stipularis*, which would have been the most appropriate, to a Rose with which I am unacquainted, but which cannot be confounded with the present.

From *R. dumetorum*, independently of certain marks which will be pointed out in the description of that species, *R. bractescens* may be known by the rounder receptacle, the mass of woolly styles, and the immense bracteæ. This latter is an important character by which it may be distinguished from the other Roses with hooked prickles and simple serratures; from most of which it also

also differs in having the leaves pubescent on both surfaces: to this may be added, that the aculei are more slender and less curved than is usual in this tribe, though quite enough so to show that they belong to it; and they are also more numerous, and the petioles are very rarely unarmed. The entire pinnæ of the calyx seem to be constant in this Rose, a circumstance seldom to be met with in those which resemble it most nearly. Its closest affinity is certainly with *R. collina*; but a careful attention to the above marks will be sufficient to distinguish it.

20. Rosa dumetorum.

R. stylis distinctis, receptaculis ellipticis bracteas superantibus, aculeis uncinatis, foliolis simpliciter serratis utrinque hirsutis.

R. dumetorum. *Thuilliers Fl. des Env. de Paris*, 250.

R. canina ξ. *Desvaux J. de Bot.* ii. 115.

Frutex 4—6-pedalis. *Rami* debiles, diffusi, olivacei, aculeati; aculei parviusculi, uncinati, subbinato-stipulares sparsique. *Petioli* pilis aculeisque uncinatis, interdum etiam glandulis instructi. *Stipulæ* lineares, apicem versus glanduloso-serratæ, margine pilosæ, eæ floribus propiores ceteris paullùm latiores, denique foliis deficientibus in bracteas lanceolatas parvas, latitudine parùm, longitudine nequaquam, stipulas superantes, immutatæ. *Foliola* 5 vel 7, sublucentia, par superius et foliolum impar ceteris majora, impar quoque etiam foliolis paris superioris semper latius, nunc elliptica acuta, nunc subrotunda acuminata, simpliciter serrata, subtus nervo-pilosa vel juniora sericeo-pilosa, paginâ utrâque hirta. *Pedunculi* 1—3, glabri, pilisve sparsis tantum instructi, bracteas plerumque subæquantes, interdum superantes. *Receptaculum* ellipticum vel ovatum, nunc fuscum, nunc floribus decidentibus olivaceum, glabrum. *Calycis foliola* triangulari-elliptica, acuminata, plerumque glabra, rarius pilosa, composita; pinnis confertis lanceolatis hic illic incisis, margine sæpius integerrimis. *Flores* planiusculi, petalis rubescentibus. *Styli* subinclusi, stigmatibus in globulum villosum congestis. *Fructus* late ovatus vel subglobosus, glaber, ruber.

Hedges in the southern counties occasionally; seldom in any abundance.

This is generally a weak straggling Rose, which, in the instances which have fallen under my notice, does not flower very freely. Mr. Borrer, however,—to whose accurate observations this essay is in many instances deeply indebted,—finds a plant in the neighbourhood of Henfield in Sussex, which, agreeing in other respects with this, is yet neither of feeble growth nor unwilling to flower. Even under this appearance the aculei are usually smaller and weaker than in the neighbouring species.

β. has a stronger growth and larger aculei than are usual in α; the pinnæ of the calyx are also narrower, the flowers in a cyme, much more numerous; and both in appearance and character it approaches very near to *R. surculosa*.

γ. has a leaflet of a very dark shining green, much longer than usual in *R. dumetorum*. I have seen very little of it, and have therefore for the present joined it to this plant on account of the small bracteæ, small aculei, weak growth, and the pubescence of the leaves, which are decidedly hairy on the veins and on the surface beneath, and exhibit some scattered hairs on the upper surface: but it must be confessed, that in the shape of the leaflet and the general appearance of the plant it has little affinity with this species.

If we except the doubtful variety γ, the flat leaves of this Rose (a considerable portion of which in every plant is either subrotund and acuminate, or at least very much rounded at the base) will distinguish it, without reference to the pubescence, from *R. sarmentacea*, *R. collina*, and *R. canina*. This form and expansion of the leaf it has in common with *R. Borreri* and *R. surculosa*; but the first has its leaves doubly serrated, in the latter they are always entirely smooth on both sides. I have already recorded an observation which throws some doubt on the former character; and

and the latter is in so many instances in other families known to be variable, that I am unwilling to depend upon it entirely in this. Yet the three Roses are different in habit, and I have not been able to fix on any more permanent distinction.

21. Rosa collina.

R. stylis distinctis, aculeis uncinatis subæqualibus, foliolis simpliciter serratis subtus tantum hirsutis.

α. R. collina. *Jacq. Fl. Austr.* ii. 58. *t.* 197. *Willd.* ii. 1078. *Lam. et Dec. Fl. Fr.* iv. 441. Pedunculis setosis.

β. pallescens.

Frutex 6—8-pedalis. *Rami* subdiffusi, olivacei, aculeati; aculei uncinati, pallidi, sæpius debiles, subæquales, solitario- vel binato-stipulares. *Petioli* tomentosi, incani, aculeisque falcatis muniti. *Stipulæ* lineares, apicem versus serratæ vel glanduloso-serratæ, supra glabræ, eæ floribus propiores majores, et tandem foliis deficientibus in bracteas ovato-lanceolatas immutatæ. *Foliola* 5 vel 7, par superius et foliolum impar ceteris majora, elliptica, enormiter (sed nunquam duplicato) serrata; serraturis apice pallide cartilagineis, subtus hirsuta, supra glabra, glauca, et nitoris expertia. *Pedunculi* 1—5, glabri, bracteis breviores. *Receptaculum* ellipticum, glabrum, olivaceum. *Calycis foliola* ovato-lanceolata, apicem versus pilosa, pinnata; pinnis lineari-lanceolatis incisis, plerumque margine integerrimis. *Flores* planiusculi, pallide rubescentes. *Styli* inclusi, stigmatibus convexis. *Fructus* ellipticus: maturi colorem non observavi.

Hedges in the southern counties occasionally.

γ. R. canina *γ.* *Lam. et Dec. Fl. Fr.* iv. 447.
R. dumetorum. *Lam. et Dec. Fl. Fr.* vi. 534.

Stems stronger but more diffuse, brown; aculei strong, brownish, and much more hooked than in *R. collina* *β*; leaflets of a bright shining green on the upper surface, generally somewhat carinate, while in *β* they are rather slightly concave; tips of the serratures fusco-cartilagineous. Flower-stalks one to nine. Receptacle broader than that of *β*.

Flowers sometimes white, sometimes of a full blush-colour. Fruit often subglobose. Hedges throughout England very common.

δ. A compact bush three or four feet high, thick with leaves, the leaflets small, very acute, silky underneath. Near Dovedale, Derbyshire.

There is no species of *Rosa* in which my endeavours have been more unsuccessful than in this. I am neither satisfied in what I have joined together, nor in the marks by which I have attempted to discriminate it from other species. The variety α is adopted merely from Jacquin; and, as far as is at present known, is not a British plant. I have therefore drawn up my description from the variety β: an examination of the specimens of *R. collina* possessed by Sir J. E. Smith, and of those in the Herbarium of Sir Joseph Banks, and a comparison of these with the figure in the *Flora Austriaca*, enable me to state that this variety differs only from α in the want of hairs or glands on the peduncle. In this state it approaches very nearly to *R. bractescens*, being scarcely distinguishable, except by the somewhat smaller bracteæ and the entire nakedness of the upper surface of the leaf; and as that species has frequently a glandular, or rather a weakly setose peduncle, exactly like that of Jacquin's figure, I have doubted whether I ought not rather to have attributed the name and synonym to that plant. Jacquin, however, could hardly have passed unnoticed the remarkably enlarged bractescent stipulæ accompanying the inflorescence of *R. bractescens*; he describes the prickles as "validi," although in the figure they are represented as much weaker than is the case with most Roses of this subdivision of the genus, and the folioles as "atro-virentia," whereas they are figured pale and glaucous; both figure and description attribute a dark cartilagineous summit to the serratures. These circumstances

cumstances induce me to believe that Jacquin would have included in his species most, if not all, of those different appearances which I have united into mine. The glandular footstalk varies in *R. bractescens*, *R. canina*, and other neighbouring species; which will justify us in rejecting it from the essential character in this instance, though a most diligent search has not succeeded in bringing to light a single instance of glands or setæ on the peduncle of any variety a native of this country:—once, indeed, on one plant I found a few hairs on that of the variety γ.

This last-mentioned variety is certainly a very different plant in appearance from either α or β, and may perhaps be a distinct species; but I have found myself unable to find any character by which it might be separated; and it besides varies greatly in itself both in habit and in character. The leaflets are sometimes almost as broad, but I believe never as flat, as those of *R. Borreri* and *R. dumetorum*; and the calyx-segments sometimes approach in shape and number to those of these plants; the serratures too, though never double, become sometimes exceedingly unequal. At other times the long leaflets and equal serratures might lead one, without the inflorescence, to refer it to *R. systyla*. To this variety I should refer the Rose which is mentioned by Afzelius as a hairy variety of *R. canina*, and quoted by Sir J. E. Smith under *R. cæsia*: some further observations on Afzelius's varieties of *R. canina* will be found in the account of that species. The glandular fringe of the serratures sometimes passes into hairs.

Of the variety δ I have only seen one plant, and that before its flowers were open: it was a compact bush, between three and four feet high, abounding in flower-buds; and the numerous small and very acute leaflets gave it a peculiar appearance.

In Römer's *Archiv. fur die Botanik*, *Band* i. *p.* 6. *Auc. A. ab Haller*, *R. collina* is described as having the upper surface of the

the leaves shining, with a silky pubescence. The author refers to Jacquin; but he must I think totally have mistaken the plant.

Rosa arvensis, Roth Fl. Germ. i. 217, & ii. 554; *R. corymbifera, Gmel. Fl. Bad. Als.* ii. 424, resembles in some respects the variety γ; but the leaves are said by the latter writer to be hairy on both sides. It is not explained whether the serratures of the leaves are double or single; Roth describes his plant as a robust shrub ten feet high, with leaves attenuated at both ends; a character which rather belongs to this than to any other of the pubescent-leaved Roses of the *canina* tribe.

Perhaps to this species we must refer *R. leucantha, Lam. et Dec. Fl. Fr.* vi. 535, which has white flowers, and occasionally a few hairs on the upper surface of the leaves. *R. fastigiata* (of the same work and page) may likewise be a sub-variety of *R. collina* γ, with flowers more numerous than common: the shape of the leaves will not permit me to join this latter to *R. surculosa*, with which otherwise the flowers "disposés en corymbe assez large" might indicate an affinity. All Roses with hooked thorns of nearly equal size, having the leaflets smooth above, and the petiole and midrib on the under surface hairy; the styles distinct and included, or nearly included, in the germen,—must be considered as belonging to this species. I must leave it to future investigators to decide on the one hand, whether these characters are sufficient to distinguish it as a species from *R. canina*; and on the other, whether with so much difference of habit it ought not itself to be further divided.

22. Rosa hibernica.

R. receptaculis globosis, aculeis uncinatis inæqualibus, foliolis simpliciter serratis.

R. hibernica. *Engl. Bot.* xxxi. *t.* 2196.

Frutex

Frutex tripedalis. *Rami* stricti, fusci, aculeati; aculei uncinati vel falcati, subbinato-stipulares, hic illic minoribus rectioribus sparsim intermixtis. *Petioli* pilosi, aculeis glandulisve plerumque expertes. *Stipulæ* lineares, subglanduloso-serratæ, eæ floribus propiores etiam solitariæ, ceteris multo latiores; cymarum tandem, foliis deficientibus, in bracteas ovatas acuminatas immutatæ. *Foliola* 5 vel 7, par superius et foliolum impar ceteris majora, elliptica, simpliciter serrata, supra glabra glaucescentia, subtus præcipue nervo pilosa. *Pedunculi* 1—5, glabri, bracteis plerumque breviores. *Receptaculum* subglobosum, fuscum. *Calycis foliola* triangulari-elliptica, acuta, petalis breviora, pinnata, pinnis lanceolatis integerrimis. *Styli* subinclusi; stigmata villosa, conica. *Fructus* nunc globosus, nunc fauce parum elongatâ: maturum non vidi.

In Ireland, Mr. Templeton. *Engl. Bot.*

I have never seen this plant in a wild state. The curvature of the aculei is generally less than in other Roses of this tribe,—a character in which it agrees with *R. bractescens*; but the simple serratures will readily distinguish them both from all the varieties of *R. tomentosa*; and the aculei rest on a longer base than is found on that plant. From *R. bractescens* and *R. collina* this species may be known by its dwarf rigid habit; but the most important character is derived from the mixture of small straight prickles on the branches. It is true that *R. hibernica* has this character in common with *R. Eglanteria*; but the entire want of glands, the simple serratures, and the shape of the fruit, render it impossible that any mistake should arise between them.

23. Rosa canina.

R. stylis distinctis, aculeis caulinis uncinatis petiolinis falcatis, foliolis carinatis simpliciter serratis glabris.

R. canina. *Linn. Sp. Pl.* i. 704. *Willd.* ii. 1077. *Fl. Brit.* ii. 540. *Engl. Bot.* xiv. *t.* 992. *Lam. et Dec. Fl. Fr.* iv. 447. *Fl. Dan. t.* 555.

Rosa sylvestris inodora seu canina. *Raii Syn.* 454.

Frutex laxus, 6—8-pedalis. *Rami* diffusi, olivacei, aculeati; aculei uncinati, subbinato-stipulares. *Petioli* pubescentes; aculeis falcatis, atque hic illic glandulis sparsis muniti.

niti. *Stipulæ* lineares, serratæ, glabræ, eæ floribus propiores latiores, et demum foliis deficientibus in bracteas ellipticas acuminatas immutatæ. *Foliola* 7, par superius et foliolum impar ceteris majora, anguste elliptica, carinata, acumine parvo torto, juniora lucescentia quasi fucata, glaberrima; serraturæ acuminatæ, inæquales, sed nunquam serie duplicé. *Pedunculi* glaberrimi, in ramulis solitarii vel binati rarius ternati, in surculis plerumque quaterni. *Receptaculum* ellipticum, fuscum, glabrum. *Calycis foliola* triangulari-ovata, glabra; pinnæ lineari-lanceolatæ, hic illic glanduloso-incisæ. *Flores* plerumque rubescentes, rarius albi, gemma flore expanso aliquantulum rubrior. *Styli* inclusi, stigmatibus planiusculis. *Fructus* ellipticus, glaberrimus, nitidus, coccineus.

Common in hedges and bushy places.

Under this name our early botanists seem to have included (besides the present species) *R. sarmentacea*, *R. Borreri*, *R. dumetorum*, *R. collina*, *R. surculosa*, and *R. systyla* of this essay. After all these reductions it must still be considered as a very variable Rose. I will attempt to enumerate the principal differences of appearance to which it is subject.

β. cerea. The young leaves are covered with a waxy substance, and till rubbed are of a glaucous green entirely without gloss. Root-shoots are more freely produced in this variety than in *α*, and I have sometimes met with as many as eight flowers in a cyme. The plant is eight or ten, and sometimes even fifteen, feet high; the leaflets are broader, and the little point at the end is always a little twisted; a character which may be observed in a slight degree in *α*, but is more conspicuous here. This is a very beautiful Rose, and more common than the preceding variety, from which I have drawn my description, because *R. canina* has been almost always described with shining leaves.

These two varieties form the chief subdivisions of the species, and are marked by a difference of habit as well as colour;

lour; and it is remarkable that *R. collina* and *R. sarmentacea* are not unfrequently to be observed of a habit somewhat intermediate between these varieties; so that if at first sight the young botanist should doubt whether he has the waxy or shining-leaved variety of *R. canina*, it is highly probable that a closer investigation will prove it to be one or the other of those species.

γ. *glandulifera.* Peduncle, receptacle, and calyx furnished with glands, or rather with weak setæ, which are most abundant on the latter.—Near Potter's Bar, Hertfordshire; at Pound's-Bridge, near Penshurst in Kent; near Ambleside in Westmoreland. Mr. Borrer gathered a Rose nearly resembling these specimens, and which must be referred to this variety, but with the calyx-leafits narrower and less divided, at the Pass of Lanrick.

δ. Branches, stipulæ, and petioles of a vinous red. Not rare in hedges and bushy places, generally in a barren soil.

ε. Receptacle subglobose; leaflets ovate, or lanceolato-ovate, acute, with very little appearance of the small twisted acumen. This Rose certainly does not accord well with the other varieties of *R. canina*: the shape of the leaflets, and their very irregular glandular serratures, united with the general habit, would almost justify an observer in attributing it to *R. collina*; and with this notion the subglobose fruit is not inconsistent; but the petiole veins and inferior surface of the leaflets are entirely without hairs. In some respects it resembles *R. surculosa*; but the leaflets are not flat, and the aculei of the petioles are rarely more than falcate. Near Tunbridge-Wells.

δ. *simpliciuscula.* Calyx-leafits nearly simple. A slight difference in the general habit induced me to gather this plant when I observed it near Betchworth in Surrey; but I did not then notice the character by which I now distinguish it.

Among the British Roses with uncinate prickles and leaves entirely without pubescence, *R. canina* may be distinguished from *R. sarmentacea* by the simple serratures; from *R. surculosa* by its carinate leaves, and by the weak and slightly-hooked prickles of the petioles; from *R. arvensis* by its distinct and woolly styles. *R. sempervirens* is in habit and even in family quite a distinct plant; yet it is difficult to express any decided marks of difference, except in the styles, which, though sometimes slightly porrect in *R. canina*, are never lengthened out as in that species.

Afzelius, *De Rosis Suecanis Tent.* viii. 46, describes seven varieties of *Rosa canina*, which he considers only a portion of the number of species into which this plant must be divided. The first seems clearly to be the *R. collina* γ of this essay. The second also I should probably have enumerated among the varieties of that species, but it is remarkable for a large globular hip as large as a plum—a very uncertain mark of comparison. The third plant is *R. canina* β; the fourth, *R. canina* γ; the fifth, *R. canina* α; the sixth appears to belong to my *R. surculosa.* *R. rubifolia* of Villars is quoted under the seventh of this list of Roses; but Dr. Afzelius does not seem to be of opinion that the Swedish Rose is of the same species as that of Dauphiné; the former is perhaps rather the *R. canina* δ of this essay. Besides these, he mentions many other Roses of this tribe as existing in his collection, which not having seen alive he does not venture to describe. The various appearances of this Rose are therefore probably as numerous in Sweden as in this country.

Desvaux,

Desvaux, *Journal de Botanique*, ii. 114, has no less than twenty-one varieties which he attributes to this species; but in respect to some of them he is certainly mistaken: his β is the α of this essay, and γ is the β; while his α seems to be intermediate, or rather to apply equally to either when the first appearance of the young leaves is passed off; δ seems to be my *R. collina* γ, and ε *R. collina* α; ϑ perhaps is to be referred to *R. canina* ε; η must be placed with my *R. canina* γ: ϑ the author has borrowed from Lejeune, and, as he says himself, without understanding it: ι, $\varkappa$, λ, I suppose all to belong to *R. canina* γ of this paper; μ is *R. tomentosa*, adopted from the botanists of this country. The description of the aculei might indeed mislead Desvaux; but he must be totally ignorant of our plant, as in the essential character of the species he describes the serratures simple: ν, ξ, are to be attributed to *R. dumetorum*; o probably to *R. collina*: and here also I should put π, ϱ, σ, τ: υ is *R. canina* β; φ may be *R. canina* γ: but all these references must be considerably uncertain, as the descriptions are very short; and it is not at all improbable that one or two of them ought to be quoted as *R. surculosa*. I have detailed them chiefly to show the extreme uncertainty which exists as to this species. Of the twenty-one varieties, there are at the most only ten which appear to me to belong to *R. canina*, and some even of these are very doubtful.

A conserve is made from the hips of this Rose, and probably of all those which have been hitherto confounded with it, which, as Sir J. E. Smith justly observes, would be brought to table as a sweetmeat if it were not in such frequent use as a vehicle for medicines. It is sometimes met with on the tables of the Continent. The Tartars, according to Pallas in the *Flora Rossica*, drink instead of tea a decoction of the shoots and especially of the roots of this plant: this beverage has been adopted by some of the Russians, particularly in Siberia, who highly praise the agreeable and exhi-

larating effects of it. The Russians of the Volga prepare a spirit from the flowers; they likewise preserve them with sugar and honey. The leaves dried and infused in boiling water have been recommended as a substitute for tea.

24. Rosa surculosa.

R. stylis distinctis, aculeis caulinis petiolinisque uncinatis, foliolis planis simpliciter serratis glabris.

Frutex octo-pedalis, laxus, habitû *Rosam caninam* vel potius *R. Borreri* inter et *R. arvensem* referens. *Rami* diffusi, atro-purpurei vel intense fusci, juniores glaucescentes, nunc copiose aculeati nunc fere inermes; aculei fortissimi, uncinati, nunc binato-stipulares, nunc solitarii, sparsi. *Petioli* supra tantum sparse pilosi, alioquin glabri, aculeis fortibus uncinatis muniti. *Stipulæ* spatulatæ vel lineares, nunc serratæ, nunc basi glanduloso-ciliatæ, nunc nisi apicem versus integerrimæ, glabræ, interdum margine pilosæ, eæ floribus propiores latiores et demum foliis deficientibus in bracteas ellipticas, acuminatas, immutatæ. *Foliola* 7, par superius et foliolum impar ceteris majora, acie supraque nervo tantum pilis raris instructa, elliptica, vel subrotunda, acuminata, impar basi cordatum vel ovatum, serrata, subtus glabra, obscura, juniora purpurascentia. *Pedunculi* 1—24, hic illic setis sparsis, tenerrimis, pilisve muniti. *Receptaculum* ovatum, fuscum, glabrum, disco convexo. *Calycis foliola* triangulari-elliptica, acuta fere usque ad basin divisa, pinnis lanceolatis vel lineari-lanceolatis, nervosis, integerrimis. *Flores* rubescentes. *Styli* subporrecti, villosi; stigmata in globulum congesta. *Fructus* late ellipticus, ruber.

About Albourne, Henfield, West Grinstead, and elsewhere in Sussex. Mr. Borrer. Road-side between Hayes and Bromley in Kent.

β. Surculi not so strong, redder; bush more compact; disk of the receptacle flat. Near Stoke Newington. Only one bush of this Rose has ever been observed; but the habit of the plant is very remarkable, and I had noticed it several years before I began to pay any particular attention to this genus.

The only British species which can be mistaken for *R. surculosa* are

are *R. canina*, *R. systyla*, and *R. arvensis*; and from each of these it may perhaps be difficult to give a description which shall accurately distinguish it, while in habit it is considerably different from either. From the first it may however, I think, always be known by the porrect styles, the entire pinnæ of the calyx-leafits, the peduncle almost always furnished with hairs or setæ, the shape and flatness of the leaflets, and the strong and hooked aculei of the footstalk. These marks seem indeed amply sufficient, but I am afraid they are all more or less uncertain. I have never seen the glands of the peduncle extending themselves on the receptacle or calyx; in *R. canina*, when glands are found on the peduncle, they are also generally to be observed on the fruit, and still more on the calyx; but this character likewise sometimes fails. A better distinction in the living plant is found in the enormous surculi covered with beautiful blue wax, and bearing great cymes of flowers. In the most favourable circumstances it is only by accident that *R. canina* has more than four flowers. In this plant if any surculi are produced, and it is rarely without them, the observer will not often be disappointed in searching for eight or ten, and he will sometimes find double that number; but even this mark is not very decidedly exhibited in the variety β, which seems however to unite better with this species than with any other. From *R. arvensis* it may be known by the styles, which are here hairy and but just protruded, not smooth and collected into a long cylinder, as in that plant. It is also a much more upright plant, the surculi being rather erect than decumbent. From *R. systyla* also a due attention to the styles will distinguish it; and the shape and flatness of the leaf give a decidedly different appearance to the present plant.

25. Rosa systyla.

R. stylis unitis, receptaculis oblongis, aculeis uncinatis subæqualibus surculorum confertis, foliolis simpliciter serratis.

R. systyla. *Bastard Flore d'Anjou,* as quoted by *Desvaux, Journ. de Bot.* ii. 113.

R. stylosa. *Lam. et Dec. Fl. Fr.* vi. 586. *Desv. Journ. de Bot.* ii. 113. *pl.* 14.

R. brevistyla. *Lam. et Dec. Fl. Fr.* vi. 537.

R. leucochroa. *Desv. Journ. de Bot.* ii. 113. *pl.* 15.

R. collina. *Engl. Bot.* xxvii. *t.* 1895.

Frutex gracilis, 8—12-pedalis. *Rami* vagi, olivacei, aculeati; aculei uncinati, subæquales, ramulorum minores plerumque binato-stipulares, surculorum maximi instar Psittacorum rostri. *Petioli* tomentosi, sæpe glandulosi, aculeisque parvis falcatis muniti. *Stipulæ* lineares, serrulatæ, glabriusculæ, eæ floribus solitariis propiores vix ceteris latiores, ad cymas, foliis deficientibus, tandem in bracteas lanceolatas acuminatas immutatæ. *Foliola* 5 rarius 7, par superius et foliolum impar ceteris majora, elliptica, vel lanceolato-elliptica, carinata, acuminata, simpliciter serrata, supra glabra, subtus venulis hirsuta. *Pedunculi* 1—8, glandulosi, elongati. *Receptaculum* oblongum vel elliptico-oblongum, fusco-olivaceum, glabrum. *Calycis foliola* ovato-triangularia, pinnata; pinnæ inciso-glandulosæ. *Flores* cyathiformes, petala pulcherrime rubescentia, basi parum in aurantiacum vergentia, sed interdum flores pallidiores et etiam albi inveniuntur. *Styli* in columellam porrecti; stigmata in conum congesta. *Fructus* elliptico-oblongus, glaber, coccineus.

At New-Timber, Henfield, and many other places in Sussex abundantly. Mr. Borrer. At Walthamstow and Quendon in Essex, and at Clapton in Middlesex. Mr. E. Forster. At Donnington-Castle in Berkshire. Mr. Bicheno. Near Penshurst in Kent, and near Hornsey in Middlesex.

β. Leaves entirely smooth on both sides.

I cannot hesitate in referring to one species the synonyms above quoted. *R. brevistyla* and *R. leucochroa* are said to differ in having a shorter column of styles than *R. stylosa*; but this circumstance I have

I have observed to vary considerably. *R. debracteata, Lam. et Dec. Fl. Fr.* vi. 537, ought also probably to be referred to this species: it has the styles connected, and differs from *R. arvensis* in its greater size and upright stem. The "*flore d'Anjou*" of Bastard I have not been able to meet with, I therefore trust to Desvaux: but the character of the plant is so distinct, as applied to a Rose having nearly the habit of *R. canina*, that there can be no doubt of the accuracy of the reference. Desvaux has thought proper to alter the name; but I have preferred retaining that originally proposed by Bastard, not only as being prior to the other, but also very decidedly better. The name in *English Botany* was given with the idea that this species coincided with the *R. collina* of Jacquin; from which, however, it may readily be distinguished by its elegant habit, cup-shaped flowers of a much more glowing hue, long fruit and peduncle, narrow bracteæ, and above all by its connected styles, which separate it from all Roses of the *canina* family. The difference in the size and strength of the aculei of the branches compared with those of the surculi may sometimes also be a useful character. The habit of *R. systyla* will to the practised eye keep it abundantly separate from *R. arvensis*. In artificial character they are more nearly allied; but in *R. systyla* the surculi, though weak and gracefully bending, rise upwards, unlike the long, rambling, decumbent shoots of *R. arvensis*: they are also thickly covered with large prickles; whereas those of the latter Rose have the aculei neither very large nor very numerous, but rather the contrary.

In some states this is a Rose of no very conspicuous appearance; but when it produces its root-shoots long and gently curved downwards by the weight of the numerous clustered flowers, it is hardly possible to conceive any thing more beautiful.

26. Rosa arvensis.

R. stylis unitis, aculeis uncinatis surculorum sparsis, foliolis ellipticis inæqualiter serratis.

R. arvensis. *Willd.* ii. 1066. *Fl. Brit.* ii. 538. *Engl. Bot.* iii. *t.* 188. *Lam. et Dec. Fl. Fr.* iv. 438.

R. canina β. *Fl. Germ.* i. 218. & ii. 560.

R. repens. *Gmel. Fl. Bad. Als.* ii. 418.

R. sylvestris. *Römer's Archiv. B.* i. *st.* ii. *p.* 33.

R. sylvestris minor flore albo. *Raii Syn.* 455.

Frutex altitudine 2—4-pedalis; surculis longissimis, decumbentibus, flagelliformibus, junioribus glaucescentibus, senioribus viridibus. *Rami* vagi, debiles, glauco-virides e luce purpureo-fusci, aculeati; aculei surculorum sparsi, basi latissimi, mucrone plerumque adunco instructi, ramorum graciliores. *Petioli* nunc hirti nunc glandulosi, rarius utrumque aculeati. *Stipulæ* lineares, apicem versus nunc serratæ nunc glanduloso-nunc piloso-ciliatæ, glabræ, eæ floribus cymosis propiores foliis gradatim deficientibus, demum in bracteas lanceolatas, vix stipulis latiores, immutatæ. *Foliola* 5, par inferius ceteris minus, elliptica vel subrotundo-elliptica, plana, crenato-serrata, interdum apicem versus inciso-serrata, nervo interdum subtus pilosa, sæpius utrinque glaberrima. *Pedunculi* 1—8, interdum etiam usque ad 15, elongati, glandulis subsessilibus induti. *Receptaculum* plerumque ovatum, rarius in locis sterilibus subglobosum, fuscum, glabrum. *Calycis foliola* ovata vel subrotundo-ovata, nunc hirta nunc glandulosa, pinnulis parvis lanceolatis integerrimis hic illic instructa. *Flores* albi, expansi. *Styli* in columellam glabram persistentem porrecti; stigmata in globulum congesta. *Fructus* formâ multum variat, ab elliptico-oblongo etiam ad accurate globosum, posterior tamen vix nisi in pedunculis solitariis invenitur: maturi color sanguineus.

Hedges and bushy places in the southern and midland counties; rare in the mountainous districts.

β. Fruit glandular as well as the peduncle. At Shermanbury in Sussex. Mr. Borrer. By the high rocks at Tunbridge-Wells.

Mr. Borrer has communicated to me specimens remarkably long in the leaves and fruit. This approaches in some degree to the

the *R. prostrata, Lam. et Dec. Fl. Fr.* vi. 536, which seems to be a variety of this species with shining persistent leaves; but the latter circumstance has not occurred to me in any English specimen.

This Rose has hitherto been separated from its nearest affinities on account of the shape of the fruit: but this has been done erroneously; for though the full-grown fruit is sometimes nearly globular, the receptacle, while the plant is in flower, is decidedly ovate, except occasionally in starved specimens: it is generally longer in the cymes of flowers than when solitary, differing in this respect from *R. canina* and its allies, which have usually among the cymes rounder receptacles than those of the solitary flowers.

The midrib of the leaflet is sometimes furnished with hairs: this peculiarity will occasionally occur on some branches and not on others of the same plant.

The habit of this Rose is a low bush with long trailing shoots frequently covered with a profusion of flowers opening quite flat. The buds are faintly tinged with red, but the expanded petals are I believe always white. Mr. Sabine has what he considers as a double variety of *R. arvensis*, which retains the blush colour in the flowers, and is extremely beautiful. In this the serratures of the leaves are furnished with glands which have the appearance of double serratures, as in *R. provincialis*, *R. gallica*, *R. damascena*, and *R. alba*.

In the long shoots of this plant the aculei frequently appear to consist of a short mucro on an expanded base. As the ramifications are repeated, it often happens that the expanded base diminishes in proportionate size, and the mucro becomes a hooked prickle more round and slender than in the family of *R. canina*; the smallest prickles are even sometimes quite straight.

The distinct, smooth, lengthened column of styles is alone sufficient to distinguish it from every British Rose except *R. systyla*, from which it may be known by its decumbent shoots and expanded flowers; the leaflets also are flatter, the serratures wider apart, and the whole plant of a grayer colour. When once known, their general appearance is so different that it is impossible to confound them. Among the exotics, *R. sempervirens* comes near to it in habit, while in essential character it is easily separated by its shining leaves and villous styles. *R. sempervirens* of Roth, *Fl. Germ.* i. 218. ii. 556; *R. umbellata* of Gmelin, *Fl. Bad. Als.* ii. 425; *Lam. et Dec. Fl. Fr.* vi. 532, appears to me a very different species: it is not an evergreen; the fruit is globose or nearly so, and the leaves are doubly serrated and glandular beneath. Gmelin *l. c.* remarks that it is allied to *R. Eglanteria*. It is perhaps as near to *R. Borreri* as to any British Rose; but it is scarcely possible to conceive how this could have been mistaken for *t.* 246 of the *Hortus Elthamensis*, the only plate referred to by Linnæus, and clearly pointing out his plant.

R. semperflorens is another plant of this family, and, unless the distinct styles of these Roses should make it necessary to separate them, *R. indica*. It will also contain *R. moschata*, *R. multiflora*, and *R. sinica*. Some Roses from China, of which specimens exist in the Banksian Herbarium, will probably form another family allied to this.

The hip of this species has a finer flavour than that of any other British Rose; that of *R. systyla* does not much differ in this respect.

XV. *A Botanical History of the Genus Tofieldia. By Sir James Edward Smith, M.D. F.R.S. P.L.S.*

Read January 21, 1817.

Notwithstanding the assiduous labours of so many acute and learned men in the field of Botany for three centuries past, much still remains to be done in the mere determination of species. All our care and watchfulness are still requisite, to keep the science clear of confusion, even in the history and discrimination of Europæan plants. No accurate and scientific student will find any want of employment, or of well-deserved credit, in the exclusive cultivation of this field. The more familiar the plants, the less carefully have they, often, been studied, and the more numerous their synonyms, the greater is the chance of accumulated and intricate mistakes. Those who are competent to devote themselves to this branch of scientific inquiry, will wisely avoid all loss of time about matters of opinion, concerning which, men more learned and experienced than themselves have differed, but which are in general sufficiently settled for all practical uses, though they might be debated upon for ever, without any incontrovertible conclusion. Such are many of the genera in dispute between Linnæus and other authors; in alluding to which, I by no means wish to deter young botanists from the study of genera, one of the most instructive that they can pursue. But to learn and to teach are very different things. I cannot too often protest against those more tempting roads to immortality, gratuitous

changes of names, and speculations in classification. The former can only be permitted, if at all, to the most eminent leaders and reformers of botanical science, who may be capable of acquiring supreme authority in the latter.

The writer of this paper has never thought himself more directly pursuing the best objects of that Society, now so eminent, and so extensively useful, to whose service he has so long been devoted, than when employed in those practical investigations and criticisms, by which its "Transactions" are particularly distinguished. These subjects are so far from being exhausted, that scarcely any considerable genus of plants could be taken at random out of the Linnæan herbarium, without affording matter for an ample dissertation.

The genus *Tofieldia* is known to have been involved in much confusion, as to its name and character; but no one seems aware of the still greater confusion, and intricate misapprehensions, which concern its species. I shall attempt to unravel both these subjects.

The late Mr. Dryander has well pointed out, in the second edition of Mr. Aiton's *Hort. Kew. v.* ii. 324, that our present *Tofieldia* was the real and original *Anthericum* of Linnæus, in his *Genera Plantarum, ed.* i. 106. Accordingly it there stands in the *Hexandria Trigynia*. But in the second edition of the same work, published five years afterwards, the author combines, or rather confounds, with this genus his own *Bulbine, Gen. Pl. ed.* i. 95, as Tournefort had done before him. In the first edition of the *Species Plantarum* therefore *Anthericum* is a most heterogeneous assemblage; and so it continued in all the subsequent publications of the great Swedish botanist. Some things have been done in England still further to embroil, and some to reform it. The *Hortus Kewensis*, and Mr. Brown's *Prodromus*, stand eminently

nently conspicuous among the works which have conduced to the latter object. Their authors have, in this instance, wisely exercised that discretionary paramount authority, which belongs only to the leaders in Botany, of overruling a prior claim of nomenclature. Instead of setting up the original *Anthericum*, they have retained that name for the numerous species to which it is popularly applied, and which make the bulk of the genus as Linnæus and his followers have subsequently understood it. Hence a very troublesome degree of perplexity is avoided; especially as these writers must otherwise either have invented a new name, or have restored *Bulbine*, already differently applied by Gærtner. They certainly knew better than to take up with Tournefort's *Phalangium*, which is appropriated to a genus of insects.

The author of the *Flora Britannica* indeed, aware of the above-mentioned confusion and pretensions respecting *Anthericum*, had exercised the same discretionary power, following Mr. Hudson in his name of *Tofieldia*. Under this is commemorated Mr. Tofield, a country gentleman in the neighbourhood of Doncaster, who there discovered the *Vicia bithynica*, a plant which had escaped the notice of Ray and the botanists of his time, though since observed in other parts of England. The herbarium of Mr. Tofield came, in 1793, after his decease, into the possession of Dr. Younge of Sheffield, F.L.S.

Jussieu, led by Gerard, has transferred Mœring's name of *Narthecium* to our *Tofieldia*; from an idea, as it appears, that the real *Narthecium* of that author belonged to this genus, though nothing can be more distinct. We believe it to be no less distinct from *Anthericum*, though retained in that genus, after Willdenow, in the *Hortus Kewensis*. The able M. Decandolle, not wishing perhaps to clash with Jussieu, has called this last

plant

plant *Abama*; but the prior right of *Narthecium*, published in 1742, is irrefragable.

The genus whose illustration is the object of the present disquisition, may therefore be considered as now established beyond the reach of controversy, under the following name and characters.

Tofieldia.

Huds. Fl. Angl. 157. *Sm. Fl. Brit.* 397. *Dryand. in Ait. Hort. Kew. v.* ii. 324. *Pursh Amer. Sept.* 216. *Decand. Fr. v.* iii. 193.

Anthericum. *Linn. Gen. Pl. ed.* i. 106. *Hall. Hist. v.* ii. 98.

Narthecium. *Ger. Gallopr.* 142. *Juss. Gen.* 47. *Lamarck Illustr. t.* 268.

Isidrogalvia. *Ruiz et Pavon Peruv. v.* iii. 69. Dryand.

Char. Ess. *Calyx* trifidus. *Petala* sex, æqualia. *Styli* verticales, breves. *Capsulæ* tres, superæ, basi junctæ, polyspermæ. *Antheræ* subrotundæ.

Char. Nat.

Cal. Perianthium inferum, remotiusculum, monophyllum, membranaceum, trifidum, parvum, persistens.

Cor. Petala sex, oblonga, concava, æqualia, patentia, persistentia, calyce multoties longiora.

Stam. Filamenta sex, petalis opposita, subulata, simplicia, glabra, longitudine corollæ. Antheræ incumbentes, cordato-subrotundæ.

Pist. Germina tria, supera, conniventia, acuminata, desinentia in stylos brevissimos, verticales, distantes. Stigmata capitata.

Peric. Capsulæ tres, basi connexæ, gibbosæ, carinatæ, membranaceæ, uniloculares, bivalves, intùs præcipuè dehiscentes.

Sem. Numerosa, elliptico-oblonga, angulata, valvularum margini internæ utrinque inserta.

Narthecium,

Narthecium, which agrees most in habit with the genus before us, is distinguished from it by the want of a calyx; as well as by having a simple germen and single style; hairy filaments; and a membranous tunic, tapering at each end, to the seeds. *Anthericum*, including the *Phalangium* of Tournefort and Jussieu, differs from *Tofieldia* in having no calyx; a simple germen and style; and angular seeds. *Helonias*, to which Willdenow refers our *T. palustris*, confounding under that solitary species nearly the whole genus, has a simple germen and capsule, though three styles; very few seeds in each cell; and wants the calyx.

The species of *Tofieldia* have hitherto been even less understood than its generic characters, as the following exposition will show.

1. T. *palustris*, capitulo ovato, caule glabro filiformi aphyllo, petalis obovatis obtusis, germinibus subrotundis.
   T. palustris. *Huds. Angl.* 157. *Sm. Brit.* 397. *Engl. Bot. t.* 536. *Ait. Hort. Kew. v.* ii. 324.
   T. pusilla. *Pursh Amer. Sept.* 246.
   Anthericum calyculatum. *Linn. Sp. Pl.* 447. *Fl. Lapp. ed.* ii. 106. *t.* 10. *f.* 3. *Fl. Dan. t.* 36. *Lightf. Scot.* 181. *t.* 8. *f.* 2.
   Helonias borealis. *Willd. Sp. Pl. v.* ii. 274.
   Narthecium pusillum. *Michaux Boreali-Amer. v.* i. 209.
   Phalangium scoticum palustre minimum, iridis folio. *Raii Syn.* 375. *Tourn. Inst.* 369.

   Native of the black boggy margins of pools and trickling rills, on the mountains of Lapland, Scotland, Durham, and North America, particularly lake Mistassins, flowering from June to August.

This is a perennial herbaceous plant, of humble stature, entirely smooth in every part. The *root* is horizontal and somewhat tuberous, or woody, but slender, with very long, tough, white, zig-

zag

zag fibres. *Leaves* composing numerous radical tufts, dark green, equitant, sword-shaped, ribbed, two inches long. *Stem* erect, from four to six inches high, solitary, simple, round, quite smooth, naked; triangular at the base, where it often bears one small leaf, not rising above the others. *Flowers* pale green, very small, in a little oblong, obtuse, generally very dense head, from a quarter to half an inch in length. The partial *flower-stalks* are entirely wanting, the *calyx* being crowded close to the main stalk, with hardly any perceptible *bractea*. The base of the flower within the calyx is however elongated, assuming, as the fruit advances, the appearance of a thick stalk, swelling upwards, half a line in length. *Calyx* very deeply divided into three acute segments, small, membranous, and whitish. *Petals* hardly a line long, obovate, generally quite obtuse, concave, greenish-white, longer than the stamens. *Germens* combined into a nearly globular form, with three furrows. *Styles* extremely short, spreading, with abrupt, slightly capitate, stigmas. *Capsules* converging, roundish-obovate, each about the size of mustard-seed, obtuse, with a minute spreading point crowned by the *style*.

Such is the original Lapland plant of Linnæus, exactly agreeing with specimens from Scotland and the county of Durham, as represented in *Engl. Bot.*, and answering precisely to the *T. pusilla*, adopted by Pursh from Michaux. With this has all along been confounded a Swiss species, which we are next to describe, and which is the only plant known to botanists of the South of Europe as the Linnæan *Anthericum calyculatum*. Dillenius caused this confusion, as appears by the *Flora Lapponica*; where Linnæus, who strongly suspected these two plants to be different, but never, to the day of his death, saw more than one of them, was induced by his learned correspondent to consider them as varieties of each other.

2. T. *al-*

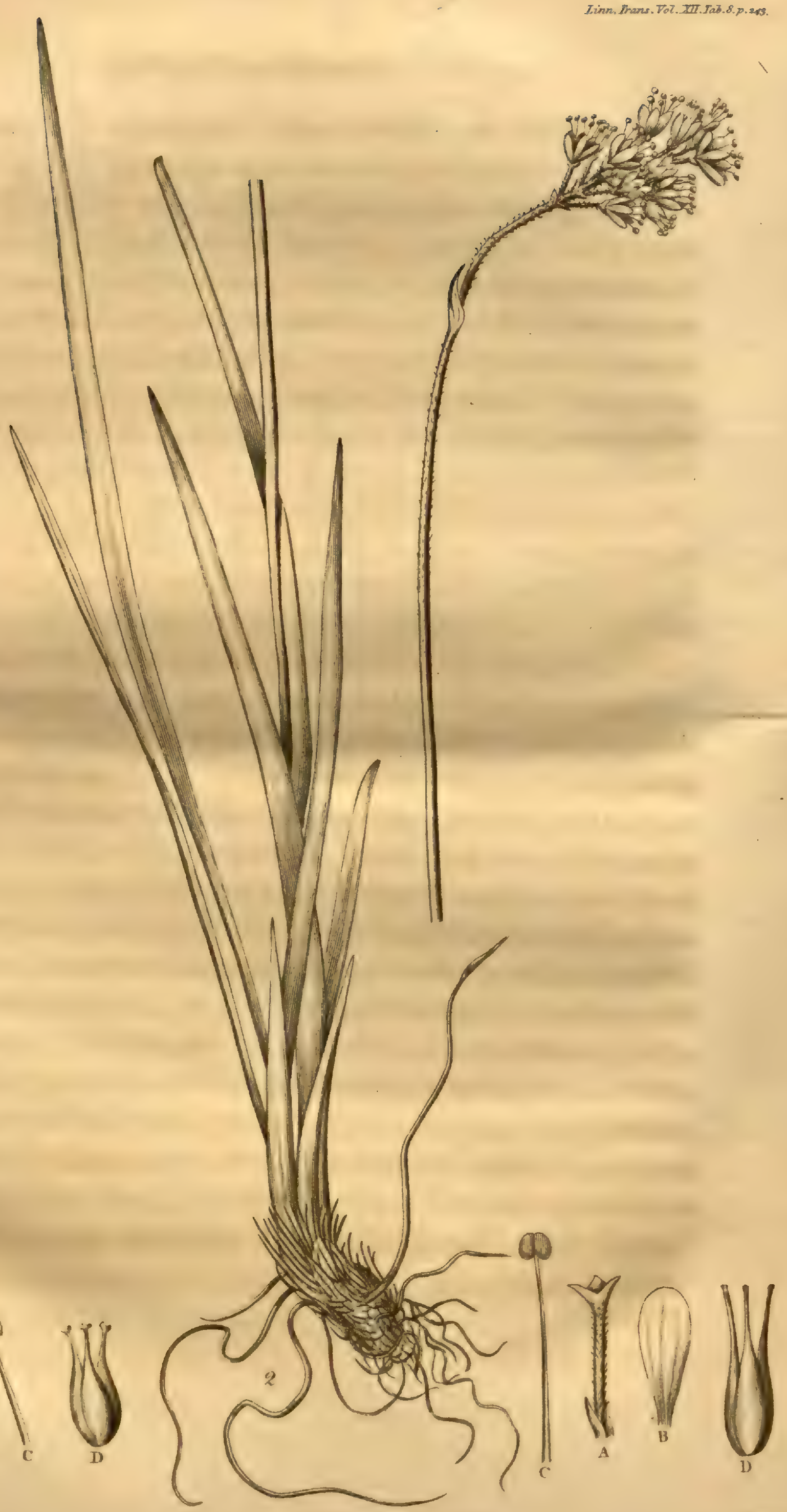
2. T. ***alpina***, racemo cylindraceo, bracteis pedunculo subæqualibus, caule glabro diphyllo, petalis obovatis, germinibus oblongis.

T. palustris. *Decand. Fr. v.* iii. 193. *Redout. Liliac. t.* 256.
Anthericum n. 1205. *Hall. Hist. v.* ii. 98; excluding the synonyms of Mœring and Gorter.
A. Pseudoasphodelus. *Jacq. Enum.* 59, 233.
Narthecium iridifolium. *Villars Dauph. v.* ii. 225.
N. calyculatum. *Allion. Pedem. v.* ii. 165. *Lamarck Franc. v.* iii. 298.
Scheuchzeria Pseudo-asphodelus. *Scop. Carn. v.* i. 263.
Phalangium alpinum palustre, iridis folio. *Tourn. Inst.* 368. *Segu. Veron. v.* ii. 61. *t.* 14. *Scheuchz. It. v.* i. 139.
Pseudo-asphodelus alpinus. *Bauh. Pin.* 29.
Pseudo-asph. pumilus, foliis iridis. *Clus. Pan.* 261. *t.* 262.
Pseudo-asph. secundus. *Clus. Hist. v.* i. 198.
Pseudo-asph. quibusdam. *Bauh. Hist. v.* ii. 634; the description, not the figure, which represents a *Pancratium*.
Asphodelus Lancastriæ verus. *Ger. Em.* 96.

Very common in moist grassy pastures on the alps of Europe, throughout Austria, Switzerland, the south of France, and north of Italy, flowering in August. Scheuchzer says it grows on the shady dry ridges of hills, and he therefore wonders at Tournefort's epithet of *palustris*. I have gathered this plant in the boggy margins of alpine rivulets, on the plain of mount Cenis. Seguier, Villars, and Allioni speak of it as an inhabitant of rich, moist, or spongy soils, among grass. Notwithstanding what is said in Gerarde's Herbal, there is no authority for its ever having been found in Britain.

This species is, in every part, twice the size of the foregoing, of which it has, till now, been considered as a variety, whose greater luxuriance, or more dilated habit, was attributed to its situation in a more favourable climate. Into this error I have been led in the *Flora Britannica*, where therefore a number of erroneous synonyms are accumulated; but the description belongs precisely to the *T. palustris*, except perhaps what regards the *bracteas* and *fruit*. So much are we frequently disposed to see with the eyes of others, that it was not before I had compared the figure in *English Botany* with that of Redouté, both cited together in *Hort. Kew.*, that I was obliged to correct my opinion. After making all imaginable allowance for possible inaccuracy in the two artists, however excellent; and for the one plate being taken from a wild specimen, the other from a most luxuriant garden plant; nothing seemed to justify a conclusion of their belonging to one species. A more close examination of the plants themselves immediately removed all uncertainty. Besides the difference of size, as above mentioned, the *root* of what I have now named *T. alpina* is much thicker in proportion, and more woody. The *stem* bears two distant *leaves*, of which the uppermost especially is much smaller than the radical ones, and if situated more than half way up the stem, it diminishes in proportion. But the most satisfactory differences exist in the *flowers*. The *inflorescence* is a *cluster* (*racemus*), from one to two inches long, frequently interrupted or scattered. The *partial stalks*, though short and thick, are always distinctly present, having a concave permanent solitary *bractea*, about their own length, at the base; and as the *fruit* advances they become more evident, a line or more in length, and curved upward. The *calyx* is close to the rest of the flower, cup-shaped, unequally and rather slightly three-

Tofieldia stenopetala.



T. glutinosa.

Weddell sc.

three-cleft. *Petals* rather more yellowish, scarcely so long as the stamens. They are represented too narrow and acute in M. Redouté's figure. *Capsules* combined almost all the way up, making together a roundish-elliptical three-lobed figure, larger than a coriander seed, of a light brown, transversely corrugated, their points widely spreading, crowned with the short thick *styles*, and capitate *stigmas*. The *seeds* are extremely numerous. The wooden cut of the old authors above cited, is quite as expressive as the copper-plate of Seguier, commended by Villars, and copied by Lamarck.

3. T. *stenopetala*, racemo cylindraceo, bracteis calycem superantibus, caule glabro diphyllo, petalis lanceolatis acutis.

Gathered by Kalm in North America, but in what part we are unable to determine. Three of his specimens are preserved in the Linnæan herbarium.

This, which Linnæus did not distinguish from his *Anthericum calyculatum*, is most akin to our *Tofieldia alpina*, with which it accords in size and habit, as well as in bearing two, sometimes three, alternate distant *leaves* on the *stem*. The *inflorescence* is a dense obtuse *cluster*, one inch and a half long, interrupted in the lower part. The *bracteas* however afford a clear specific difference, being lanceolate, and extending not only to the summit of the short and thick partial flower-stalks, but often reaching much beyond the *calyx*, which latter is very broad and shallow, unequally three-cleft, sometimes with a few supernumerary teeth or notches. The *petals* are very different in shape from both the preceding species, being lanceolate and acute. Their colour seems a greenish white. *Anthers* pointed. *Germens* ovato-lanceolate. *Styles* twice as long as the last.

Tab. VIII. Fig. 1 represents a dried specimen of *T. stenopetala*, of the natural size, with the separate parts of fructification magnified.

nified. A is the *calyx* with its *flower-stalk* and *bractea*. B, a *petal*. C, *Stamen*. D, *Germens* and *styles*.

4. T. *cernua*, racemo cylindraceo, floribus cernuis, bracteis brevissimis, pedunculis glabris longitudine corollæ, caule aphyllo. Anthericum filamentis lævibus, perianthio integerrimo. *Gmelin Mss.*

A. n. 39. *Gmelin Sibir. v.* i. 73. *t.* 18. *f.* 2; the synonyms altogether erroneous.

Native of mountainous woods, near the river Lena, in Siberia, flowering about the end of July. Specimens in flower and fruit, sent by Gmelin, are preserved in the Linnæan herbarium; and we find with astonishment that when the first edition of the *Species Plantarum* was written, they were confounded with the genuine Lapland *Anthericum calyculatum*, even by Linnæus himself.

The present most distinct species is as different from *T. palustris* as two plants of one natural genus can well be. It is more akin to our second and third species, with which it accords in general aspect, but the *roots* are of a more creeping nature, and the *stem* is taller, a foot or more in height, quite leafless, except at the very base, cylindrical throughout, glaucous in the upper part. *Leaves* narrow, near three inches long, with a small oblique point; their edges rough toward the extremity. *Cluster* erect, many-flowered, from two to four inches in length, rather lax, but scarcely interrupted. *Partial flower-stalks* nearly horizontal, slender, angular when dry, quite smooth, about one eighth of an inch long, and as the fruit advances becoming still longer. *Bracteas* solitary at the base of each stalk, and about a quarter as long, ovate, keeled, a little recurved. *Flowers* white, drooping, about twice the size of *Convallaria bifolia*. *Calyx* dilated, with three shallow,

shallow,obtuse segments. *Petals* obovate, obtuse, slightly pointed, concave, the length of the flower-stalks, and keeping pace with them in their subsequent elongation, when the petals become very narrow at the base. *Stamens* shorter than the corolla; the *anthers*, according to Gmelin, yellow. *Germens* and *styles* much like *T. stenopetala*. *Capsules* quite pendulous, shorter than the permanent corolla, obovate, very thin and brittle, combined nearly all the way up, but easily separated, each crowned with a straight spreading *style*, and capitate *stigma*. *Seeds* very numerous, small, slender, prismatic.

Gmelin mentions, on the authority of Steller, a variety with leaves upon the stem, which we should suspect to be a different species; but without seeing specimens, we can determine nothing respecting this point.

5. T. *pubens*, racemo cylindraceo interrupto, pedunculis fasciculatis scabris longitudine corollæ.

T. pubens. *Dryand. in Ait. Hort. Kew. v.* ii. 325.

T. pubescens. *Pursh Amer. Sept.* 246.

Narthecium pubens. *Michaux Boreali-Amer. v.* i. 209.

Melanthium racemosum. *Walt. Carol.* 126.

Anthericum filamentis lævibus, perianthio trifido. *Linn. Hort. Cliff.* 140. *Gron. Virg. ed.* i. 39.

A. foliis ensiformibus, perianthiis trilobis, filamentis glabris. *Gron. Virg. ed.* ii. 51.

Asphodelus minor albus. *Pluk. Mant.* 29. *Phyt. t.* 342. *f.* 3.

Native of moist meadows, swamps, and mossy boggy woods, in Virginia and Carolina, flowering in July. *Clayton, Pursh.*

Having no specimen of this, I postpone its description, till I can examine the Banksian herbarium. It makes the last of five species, which have been confounded together under the Linnæan *Anthericum calyculatum*.

6. T. *glu-*

6. T. *glutinosa*, racemo ovato coarctato, pedunculis glutinosis scabris longitudine corollæ, antheris orbiculatis exsertis.
   T. glutinosa. *Pursh Amer. Sept.* 246.
   Narthecium glutinosum. *Michaux Boreali-Amer. v.* i. 210.

Native of North America, from Quebec to lake Mistassins, according to Michaux. Our specimen was gathered by Mr. Menzies, on the west coast of North America, and is the same with what Mr. Pursh saw in the Banksian herbarium. We have no reason to suspect the plant of Michaux to be different. He says it has "the habit of the Linnæan *Anthericum ossifragum*," and that "the spike consists of a few alternate *fasciculi*; the capsule is ovate, twice as long as the calyx." By *calyx*, he means *corolla*, and by *spica*, *racemus*, as is evident from the rest of his account. Mr. Pursh therefore is inaccurate in copying his phraseology, which contradicts his own generic character of *Tofieldia*.

Mr. Menzies's specimen has a thick tuberous horizontal *root*, with long simple brown fibres, being undoubtedly perennial, like the rest of the genus. *Stem* erect, a foot high, angular, at least when dry, roughish all over with short glandular hairs; more densely hairy for the space of two inches from the top, where it bears a small leafy *bractea*, possibly not constant. *Leaves* rather few, all radical, except one or two on the very lowest part of the stem, which do not rise above the others; they are all erect, four or five inches long, narrow, ribbed, bright green, smooth, except a slight roughness towards the point. *Cluster* scarcely an inch in length, ovate, obtuse, of twelve or fourteen flowers, on hairy *stalks*, sometimes in pairs, hardly a quarter of an inch long, erect or slightly spreading, having at the base one or two membranous acute *bracteas*, one-third their own length. *Calyx* not deeply lobed. *Petals* yellowish, obovate, about as long as the flower-

stalks.

stalks. *Stamens* equal, thread-shaped, quite smooth, a little longer than the corolla. *Anthers* purplish, nearly orbicular, pointless. *Germens* ovate-oblong, taper-pointed. *Styles* rather elongated, with small *stigmas.*

Having seen nothing of the *capsule*, we cannot compare it with Michaux's description.

This is unquestionably very different from the *Narthecium glutinosum*, described by Mr. Gawler in *Curt. Mag. t.* 1505, the latter being a real *Narthecium*, called by Pursh *N. americanum*; see his *Flora, p.* 227.

Tab. VIII. Fig. 2 is taken from Mr. Menzies's specimen of *T. glutinosa.* A, *Calyx* magnified, with its *flower-stalk* and *bracteas.* B, *Petal.* C, *Stamen.* D, *Germens* and *styles.*

Norwich, Jan. 20, 1817. J. E. Smith.

XVI. *A Monograph of the Genus Pæonia. By the late George Anderson, Esq. F.L.S. &c.*

Read February 4 and 18, 1817.

The male and female Pæonies of Theophrastus, Pliny and Dioscorides are ascertained to be the plants that were known by those names after the revival of letters. Clusius, of the sixteenth century, seems to have been the first who made any addition to these. That truly original writer describes the plants he saw during his travels with a clearness which, considering the infant state of science at the time, deserves more praise than seems to have been bestowed on him. A number of botanical authors towards the close of the sixteenth and throughout the seventeenth century, chiefly copying him and each other, increased the catalogue; but their descriptions are in general so ill defined, and so replete with inaccuracies, that much information cannot be obtained from them. John Bauhin and our countryman Morison are the principal writers, after Clusius, who can be depended upon, till the days of Linné; and his opinions upon Pæonies were singular and erroneous.

In the *Hortus Cliffortianus*, his earliest publication, in 1737, he discloses doubts on the subject by observing underneath *P. officinalis*—"*Qui considerat notas essentiales structuramque plantæ, non potest non palpitare vastum istum apud authores numerum, non nisi meris varietatibus constare.*" He afterwards makes up his mind; and in the first edition of *Species Plantarum* reduces all the Pæonies

nies into one species, with this sweeping remark, "*Limites inter species non reperi, hinc conjunxi.*" Retzius, his pupil, the first who questioned the correctness of this opinion, makes the following just observation thirty years afterwards: "*Genus Pæoniæ nimis contraxit illus. a Linné, character specierum utique difficilis non tamen impossibilis. Si Pæonia anomala pro distincta haberi debet specie, non video cur ni etiam reliquæ, nec mihi persuadere potui omnes ab una productas fuisse. Si vero quis aliter sentiat, per me licebit; tunc vero binæ tantum statui debent Pæoniæ species,* Officinalis *nempe et* Tenuifolia. *Memoratas species sæpius e seminibus educavi semper sibi similes.*" The truth of this is confirmed by all our experience; for the seedling plants preserve uniformly, as far as we have observed, the habits and characters of their parents, But there is great difficulty in discovering sufficient marks of distinction between them; which, however, we ought not to presume in any case to be insurmountable, though we may have failed in overcoming it in some instances.

Linné admits the newly-discovered *P. tenuifolia* into his second edition of the *Species Plantarum*, and *P. anomala* is described as a new species in his *Mantissa*; but he persists in considering the old male Pæony only as a variety of the female, though they are distinguished by characters fully as opposite as those by which the two former species are distinguished from either; nor does he ever acknowledge any of those with pubescent leaves to be distinct species, although several of those found in the old authors are unquestionably genuine. But even the error of this great man has on the present occasion proved beneficial to science, by repressing that prevailing propensity among botanists to increase too much the number of species: for no writer has since presumed to take up any of those rejected by him, without mature consideration and well-grounded proof.

Retzius, Pallas, and Murray are the principal botanists who

have described Pæonies with precision after Linné, and their descriptions are excellent as far as they go; but the accession of new species lately discovered, and as yet but imperfectly described, together with the necessity of a thorough revision of those that were formerly known, rendered some attempt like the present requisite. If it shall be found to possess any merit, it is not to me, but to my much esteemed friend Joseph Sabine, Esq. F.R.S., &c. that it is to be ascribed: that gentleman for several years has collected with indefatigable pains all the Pæonies he could discover both from public and private gardens. Having at length assembled upwards of seventy plants under different names in his garden at North Mimms, he began, by comparing them together, to produce order out of confusion. It was at his particular invitation that I first attempted to describe them; and it has been by the assistance of his information that I have been enabled to proceed in the undertaking. I have, therefore, to avoid the necessity for reiterated acknowledgements, taken the liberty of employing the plural number, as including him, in the composition of the following account.

I do not enter into any examination of the general character, further than to repeat what has been hinted by others; that the genus properly belongs to *Polyandria Trigynia*, not only because the species more generally exhibit three pistilla than any other number, but also because this is its most natural position: it should stand, in my opinion, between *Aconitum* and *Homalium* in the factitious arrangement. The *germina tomentosa*, will now be expunged from the natural character, there being two species with smooth germens.

The descriptions are made out from an actual examination of each living plant; and it affords no small satisfaction to say, that very few if any of the plants taken notice of up to the present time remain unaccounted for: a few, indeed, which appear to be

questionable,

questionable, are noticed as such in their proper places. I have rejected many synonyms of the old authors, from motives of caution: but I am inclined to believe that every species enumerated by them refers to some one or other of the plants here recorded.

It was deemed necessary to be more particular in describing the varieties than is customary in a scientific paper; not only because some of these may hereafter turn out to be distinct species, but also with a view to render the tract useful to cultivators as well as to botanists; and by referring each plant at present known to the old authors, in all cases in which they can be followed, to guard in future, as much as possible, against the confusion which their inaccuracies have produced.

I have rejected the *folium ternatum* in the specific characters, as being common to the whole: and for the same reason I have avoided in the descriptions the repetitions of such terms as *caulis uniflorus*, *caulis angulatus*, *petioli supra canaliculati*. The number of stamina is also omitted, as being very indefinite.

There are two parts, however, in the organization of the Pæonies, which appear to me to deserve more attention than has been paid to them; but they attracted my notice when it was too late for me to avail myself of them: viz. the shape and number of the stipulæ attached to the caudex, and the form and structure of the perigynous substance which belongs to all the species. These may perhaps hereafter form important objects for specific distinction.

All the species hitherto known are confined to the northern hemisphere, and no one has yet been found in any part of America. They belong to cold climates. Some species indeed are indigenous in the south of Europe; but they grow upon elevated situations. They are, as far as has yet been tried, sufficiently hardy to stand our winter unprotected.

PÆONIÆ SYNOPSIS SPECIERUM.

Fruticosa . . . . . 1. *Moutan.*
Herbaceæ
  Folia glabra
    Fructus glabri
      caulis multiflorus . . . . . 2. *Albiflora.*
      caulis uniflorus . . . . . 3. *Anomala.*
    Fructus pubescentes
      foliola linearia . . . . . 4. *Tenuifolia.*
      foliola lanceolata . . . . . 5. *Officinalis.*
      foliola ovata, planiuscula . . . . . 6. *Corallina.*
      foliola subrotunda, undulata . . . . . 7. *Daurica.*
  Folia pubescentia
    Foliola canaliculata
      stigmata elongata, erecta . . . . 8. *Humilis.*
      stigmata obtusa, recurvata . . . . 9. *Decora.*
    Foliola planiuscula
      germina arcuato-patentia . . . . 10. *Arietina.*
      germina adpressa, recta
        foliola profunde lanceolata . . . 11. *Peregrina.*
        foliola brevissime fissa . . . . 12. *Paradoxa.*
        foliola lateralia subsessilia . . . 13. *Mollis.*

1. PÆONIA MOUTAN.

P. caule fruticoso, foliolis distinctis summo apice trifidis, germinibus tomentosis urceolo membranaceo inclusis.

P. Moutan. *Hort. Kew. ed.* ii. *v.* 3. *p.* 315.

P. officinalis. *Loureiro Flo. Cochinchinensis,* 343. *Thunb. Flo. Jap. p.* 230.

Le Moutan. *Mémoires des Chinois, v.* iii. *p.* 461.

Botan. *Kæmpf. Amæn. Exot. p.* 862.

Radix ramosa. *Caulis* 4-pedalis, lignosus (medulla crassa), ramosus, cortice rugosiusculo, fusco. *Ramuli* annotini simplices, alterni, pedunculis unifloris deciduis terminati, basi stipulis numerosis cucullatis vaginantibus aucti. *Petioli* longissimi, glabri, atropurpurei, axillis nigricantibus. *Folia* biternata, foliola plana, ovata, basi obtusa, interdum obliqua,

liqua, supra glabra, saturate viridia, venis atropurpureis: subtus cæsio-glauca, pilosiuscula. *Foliolum* intermedium sæpius inciso-lobatum, subinde obtuse trifidum; lateralia integriora, minora, subsessilia. *Bracteæ* foliaceæ calyci approximatæ. *Calycis foliola* numeri incerti, glabra, mucronata. *Petala* 8—13 palmaria, expansa, obcordata, eroso-crenata. *Membrana* perigyna tenuis, glabra, rubicunda, primum ovata, apice stigmata effundens, dein germinibus tumentibus rupta. *Germina* circiter 5 parum tomentosa, demum patentia. *Stigmata* lineari-compressa, recurvata, purpurea. Floret ad finem Maii.

A minute account of this species is given in the *Mémoires des Chinois* by the Missionaries, Paris 1778: from whom we learn that it is the pride and glory of the Chinese, who have cultivated it by their own accounts for upwards of 1400 years; and its varieties, from two to three hundred in number, are cherished with no less consideration than the Dutch florists do their tulips; and that it is a theme for their poets and painters, and prized even by their emperors, not only on account of the beauty but of the sweet perfume of its flowers. The colour of these is represented to consist of different shades of purple, crimson, violet, rose, yellow, white, *black!* and blue. Their tradition of its first origin is of its being discovered by a traveller on the mountains of Ho-nan: no notice is taken of its being now found there, or any where else in a state of nature; and Loureiro and Thunberg only describe it as being every where cultivated in the gardens of Japan and Cochinchina.

The Chinese take credit for rendering it a shrub by means of their superior art in gardening, for which they plume themselves greatly. It is possible that they might mistake *P. albiflora*, which is found in China, for the original state of this plant. At this we need not wonder, when two European botanists mistook it for *P. officinalis*. We cannot for a moment doubt of the shrubby stem being natural, although it bears a strict analogy to the subterraneous

terraneous caudex of the herbaceous plants, of which it seems to be nothing more than a prolongation, each annual shoot being simple and subtended by numerous vaginal stipulæ, which in those rise only to the surface of the ground, and are not wanting in any of the species. The membrane too which envelops the germens, and which some botanists have suspected should remove this plant to a new genus, is only a more extended example of the truly perigynous crown which surrounds the base of the germens in all the Pæonies.

The seeds are represented as being black; we have not seen them matured: its leaves are not shining as in *albiflora*, nor are they totally divested of pubescence. The woolly germens would sufficiently distinguish it from that species, though all the other marks were removed.

α. *papaveracea*; petalis 8—13, albis, basi macula purpurea notatis.

P. papaveracea. *Bot. Repos.* 463. *Rees's Cycl.*

Introduced by Sir Abraham Hume, about the year 1806, from China. This should be considered as the type of the species, the other varieties having double flowers. Its capacity to stand the rigour of our climate is not as yet sufficiently tried, being still too rare and valuable to risk with the full experiment; but we think it will prove to be hardy. Its petals are white, very broad and large, obcordate, with a blotch of deep purple at the base of each. The membrane that surrounds the germens is more entire in this than in the other varieties, the united mass of germens is ovato-spherical, and more tapering at the apex than the capsule of the poppy, with only a small orifice at the top to let out the stigmas, which are reflexed and form a star of bright purple: these,

with

with the petals, produce a contrast of fine colours seldom to be equalled in one flower.

β. *Banksii*; foliolis apice fissuris obtusis, floribus plenis, petalis medio rubicundis.

P. suffruticosa var. flo. purpureo. *Bot. Repos.* 448.
P. Moutan. *Bot. Mag.* 1154. *Rees's Cycl.*

Introduced in 1789 by Sir Joseph Banks; the first of the species that appeared in Europe, and which has hitherto been found the most hardy.

The leaves of this variety are more obtuse than those of *papaveracea*, not so glaucous on the under surface, and darker green on the upper: these, however, are only distinctions of comparison. Calyx composed of eight or ten leaves; corolla of twenty to thirty petals, very large, nearly white in the margin, with an indistinct streak of dull purple along the middle.

γ. *rosea*; foliolis apice fissuris obtusissimis, floribus subplenis, petalis roseis.

P. suffruticosa. *Bot. Repos.* 373.

This variety was introduced about the year 1794 by the late Right Hon. Charles Greville into his garden at Paddington: it is more tender than the preceding; and has no other claim for preference to it, but in respect to its smell, which is very fragrant, not unlike that of the rose: the flowers, when weak, are frequently almost single; petals rose-coloured; leaves more pale; leaflets broader, more obtuse, and smoother on the upper surface than those of *Banksii*, and the buds push out in the spring of a more ruddy hue.

We may expect new varieties of this interesting species from China.

2. PÆONIA ALBIFLORA.

P. caule subtrifloro herbaceo, foliolis ovato-lanceolatis confluentibus laciniatis, germinibus glabris, floribus erectis.

P. albiflora. *Pall. Ross. v.* ii. *p.* 92. *t.* 84. *Willd. Sp. Pl. v.* ii. *p.* 1222. *Hort. Kew. v.* iii. *p.* 316. *Rees's Cycl.*

P. lacteo flore, foliis utrinque viridantibus et splendentibus. *Gmelin in Amman. Ruth.* 77. *n.* 103.

P. fructibus tribus glabris. *Gmelin Sib. v.* iv. *p.* 184.

Radicis tubera fusiformia, fusca, aggregata. Planta omnino glaberrima. *Caulis* bi- tripedalis et ultra, angulosus, flexuosus, in duos aut tres pedunculos versus apicem desinens, interdum simplex, præcipue apud axillas (petiolumque) rubescens. *Folia* biternata, foliola modo lobata, seu incisa, decurrentia, hinc confluentia, lanceolata, latitudine et figura, secundum varietates, valde diversa, acuminata, subtus nitidissime viridia, supra saturatiora, venis atro-rubentibus protuberantibus, marginibus scabra. *Bracteæ* nonnullæ foliaceæ, inferiores partitæ, superiores in calycis foliola orbiculata sensim transeuntes. *Corolla* variat petalis 8—14, colore vario a niveo ad roseum, subincisis, erosis, plicatulis, interioribus angustatis. *Stamina* splendide aurea. *Membrana vere perigyna* longior quam in cæteris speciebus herbaceis, lobata seu lacera. *Germina* 3—5, primum erecta demum recurvato-patentia; stigmata obtusiuscula reflexa. *Floret* fine Maii ad finem Junii.

We had almost persuaded ourselves that Besler's two figures in *Hort. Eyst. Plant. Vern. ordo* vi. *no.* 12 & 13, belonged to this species;—but what can we say for an author's accuracy, who delineates *P. officinalis* with a divided stem supporting two flowers?

Native of a vast range of latitude, from the northern regions of Siberia down to the dominions of China. Pallas found it in Mongol Tartary, and on the borders of Lake Baical. Its roots, he says, are used as an article of food by the Tartars, and the seeds reduced to powder mixed with their tea. Discovered also on Mount Caucasus, and in Georgia on grassy hills.

In proportion to the diversity of climate it is found to vary in form and stature. We have in vain endeavoured to discover any fixed

fixed marks of distinction between the nine plants enumerated below, and are obliged to conclude that they all belong to one original species. In their relative connexion, the three double varieties from China are the furthest apart, yet they differ from the others only in degrees of comparison; in the essential points there appears to be no discrepancy whatever. This species is distinguished from *anomala*, with which only it can be confounded, by its erect flowers, more obtuse foliage, and above all by its having more than one flower on its stem, a property possessed by no herbaceous Pæony but itself. Nor ought we to omit mentioning the seed, the uniform brown colour of which is peculiar to this species, and serves materially to confirm our opinion, those of all the other herbaceous species being black when ripe.

α. vestalis; foliolis latioribus planis purpurascentibus, corolla albicante octo-petala, stigmatibus ochreis, caulibus 2—3-floris.

P. albiflora. *Andr. Repos.* 64, *bona.*

This variety, obtained by Mr. Sabine from Messrs. Lee and Kennedy under the name of *albiflora*, perhaps more common among our gardens than any other, is to be distinguished by its white eight-petalous corolla, rarely and slightly tinged with pink at the base. Cymes of two or three flowers; the middle flower is the strongest, the earliest, and always the shortest. This observation indeed applies to most of the species. Leaves broader, more flat and shining; and these and the stem, together with the petioles, are altogether of a darker hue than most of the others. The stigmas are of a dull yellow.

β. candida; foliolis latioribus planis saturate viridibus, corolla pallide carnea octo-petala, stigmatibus carneis, caulibus bifloris.

Mr. Sabine found this variety at Mr. Knight's nursery, in the King's-road. He had it from the Liverpool botanic garden under

the name of *sibirica*; but it is not the plant which generally gets that name; and it differs from the foregoing in having its leaves and stalks less of a purple hue, in its disposition to have fewer flowers on the cyme, and in the stigmas being flesh-coloured instead of yellow. The plant too seems weaker. The flowers of this as well as the foregoing go off white (a florist's term); but this has rather a greater dash of pink in its opening corolla.

γ. *tatarica*; foliolis latioribus planis purpurascentibus, corolla carnea 9—14-petala, stigmatibus carneis, caulibus 2—3-floris.

P. edulis. *Paradisus Londinensis*, 78.
P. albiflora. *Botanical Register*, 42.

Mr. Sabine got this variety from Mr. Biggs, who cultivated it in the botanic garden of the late Mr. Swainson of Twickenham. Another plant of the same was presented to him by Sir Joseph Banks, whose hands are always extended to promote objects of science. The original, we believe, was imported by the late Mr. Bell of Brentford, to whom we are indebted for the introduction of several Pæonies, by means of his correspondence with Pallas. It came from Tartary. Its hue, though darker, a good deal resembles that of *vestalis*; but its flowers are larger, with a greater number of petals, which retain a pale pink colour till they drop. The stigmas are of a pink colour, like those of *candida*. The figure in the *Botanical Register* is from a specimen out of Mr. Sabine's collection.

δ. *sibirica*; foliolis concavis dilute viridibus, corolla omnino nivea 8-petala, stigmatibus carneis, caulibus bifloris.

Raised from seed by Messrs. Loddiges and Sons, and said to come from Siberia through Pallas. Leaves yellowish-green, and flowers quite white even in the bud; is altogether divested of that purple tint

tint in the stalks, leaves, and germens, so observable generally in this species. It also bears the largest flowers, which seldom exceed two on each stalk: in this we suspect, however, it is subject to vary, for Mr. Sabine observed a plant last year at Kew with a greater number of flowers, which he takes to be this variety.

ε. *rubescens*; foliolis concavis angustioribus purpurascentibus, corolla rubente 8-petala, stigmatibus ochreis, caulibus trifloris.

This plant was purchased by Mr. Ronalds, nurseryman, of Brentford, at the sale of the late Mr. Bell's collection. Sir Abraham Hume has the same plant, and we believe from the same source, under the name of *tatarica*. This is the most diminutive variety, and with flowers of the darkest colour. The leaves are small, obtuse, concave or channelled on the upper surface. Perhaps this may be the variety γ of the *Paradisus Londinensis* "petalis roseis." The petals of our plant are pale red, narrow, and small; stigmas of the same colour as those of var. α.

ζ. *uniflora*; foliolis concavis angustioribus, corolla albicante 8-petala, stigmatibus ochreis, caulibus subsimplicibus.

P. *albiflora*. *Bot. Mag.* 1756.

We are informed by Messrs. Loddiges that they had seeds of this plant from Pallas. We observe it among the gardens about London under different names. It is to be distinguished from the other varieties by the narrowness of its leaves, and a disposition to produce only one flower on the stalk: in this particular, however, we doubt its constancy. The petals are white, slightly tinged with pink at their base. Stigmas dull yellow, like those of var. α.

η. *Whitleji*; foliolis rugosioribus inæqualiter laciniatis, floribus ple-

nis carneo-albicantibus, caulibus tripedalibus sparsis subquinquefloris.

P. albiflora flo. pleno. *Andrews's Repos.* 612, *mala.*
P. albiflora Whitleji. *Sabine in Hort. Tr. vol.* ii. *p.* 277.

In regard to this and all the double-flowering herbaceous varieties, we shall refer to an account drawn up by Mr. Sabine on them, read to the Horticultural Society, and about to be published in their Transactions.

This beautiful plant was imported in 1808, from China, by Mr. Whitley, nurseryman, of Fulham. Stems full three feet high; leaves rugose and less shining than is usual in the species; flowers full double, having the outside petals reddish, and the inside petals pale straw-coloured. the whole becoming nearly white before they drop off, emitting a scent somewhat like that of elder-flowers. It flowers about the middle of June.

ϐ. *Humei*; foliolis rugosioribus inæqualiter laciniatis, floribus plenissimis rubentibus, caulibus 4-pedalibus sparsis 3-floris.

P. edulis var. sinensis. *Bot. Mag.* 1768.
P. albiflora Humei. *Sabine in Hort. Trans. vol.* ii. *p.* 279.

Introduced by Sir Abraham Hume, Bart. from China, through the means of Captain Welsted, in 1810. The largest of all the herbaceous Pæonies, the stems sometimes exceeding four feet in height; flowers extremely double, reddish in colour, somewhat similar to the following, but larger and almost scentless. Cymes commonly of three flowers; leaflets broader than any other of the species, much pitted and rugose.

ɩ. *fragrans*; foliis rugosioribus angustioribus pallidis, floribus plenis roseis, caulibus 3-pedalibus erectis 1—3-floris.

P. albiflora fragrans. *Sabine in Hort. Trans. vol.* ii. *p.* 278.

Introduced

Introduced from China in 1805 by Sir Joseph Banks. This variety is conspicuous in its upright slender stalks, leaves more pale, and narrower, than those of the other two double ones, scabrous, and obsoletely serrated on the margin. It flowers the latter end of June, the latest of all the Pæonies, of a pale rose-colour, giving out an agreeable scent similar to that of the rose. The central petals are longer than the others, and erect.

These varieties are hinted at by Loureiro in his *Flora Cochinchinensis*. He states that the Pæony is found both wild and cultivated over all the Chinese empire, chiefly in the northern provinces; and concludes, "Sunt aliæ multæ varietates (fortasse species) quas non vidi." We may look for an increase to our acquisitions from that quarter.

3. PÆONIA ANOMALA.

P. caule unifloro, foliolis multipartitis, laciniis lanceolatis germinibusque glabris, flore nutante.

P. anomala. *Linn. Mantiss.* 247. *Retz. Obs.* iii. *p.* 36. *Murray in Act. Soc. Gott. v.* vii. *p.* 90. *Willd. Sp. Pl. v.* ii. *p.* 1222. *Hort. Kew. ed.* ii. *v.* iii. *p.* 316. *Bot. Rep.* 514. *Bot. Mag.* 1754.

P. fructibus glabris patentibus. *Gmelin Sib.* iv. *p.* 184. *t.* 72.

P. laciniata. *Pall. Ross. v.* ii. *p.* 93. *t.* 85. *sub P. sibirica.*

Planta tota glabra. *Radicis tubera* fusiformia, magna, subsessilia. *Caulis* bi- tripedalis, uniflorus, angulato-cylindraceus, rubicundus. *Folia* biternata seu ternata, pinnatifida, hinc dissecta laciniis angustis acutis, decurrentia; subtus nitentia, venis prominentibus. *Bracteæ* foliaceæ, corollam subæquantes, calyci connexæ. *Calycis foliola* orbiculata, acuminata, nonnunquam bifida, apice rubentia. *Corollæ* nutantis petala 6—8, inæqualia, apice erosa, emarginata, seu bifida, punicea. *Germina* plerumque 5, in stellam disposita, glabra, nitentia, æqualia, depressa, demum patentia, vix recurvata. *Stigmata* plana, erectiuscula, lunata, rubra. *Calli* fungosi, difformes, coronam circum basin germinum formant, quâ notâ optime species distinguitur. *Semina* nigra, ovata, lævia, splendentia. *Floret* ad finem Maii.

This

This is a most distinct and well-marked species, being endowed with one unique property, in having its flowers constantly drooping to one side. It differs also essentially from *albiflora* in being supplied with only one flower on the stem; and from all the other smooth-leaved species by its smooth germens. The earliest notice of it appears in Gmelin's *Flora Sibirica*, published at Petersburg in 1747. Though Linné does not acknowledge it in either edition of his *Species Plantarum*, it is at length admitted in the *Mantissa*.

Native of all Siberia, and frequent on the Altaic mountains. It was first introduced into England by the late Mr. Bell, from Pallas, about the year 1788, as *P. laciniata*, under which name it is described in *Flora Rossica*, but on its figure in the same work it is called *sibirica*. Pallas sent seeds of it to Murray as *P. heterophylla*; and it appears as *P. quinquecapsularis* in the Description of the Russian Empire by Georgi, who found it eastward of the river Ural, for we believe this to be our plant. We must, however, preserve the original name given by Linné, however objectionable.

The roots grow to a great size in their native state, and together with those of *albiflora* compose part of the food of the Mongol Tartars. Gmelin says the roots have a smell similar to that of the Florentine Iris; and Pallas compares it to that of bitter almonds or peach-kernels.

The fleshy protuberances which surround the base of the germens are nothing else than the perigynous membrane in another form, an appendage which never is entirely wanting in any of the species.

4. PÆONIA TENUIFOLIA.

P. foliolis multipartitis glabris lineari-subulatis, pedunculis brevissimis, germinibus tomentosis erectis.

P. tenui-

P. tenuifolia. *Linn. Sp. Pl. ed.* ii. *p.* 748. *Gmelin Sib.* iv. *p.* 185. *t.* 73. *Linn. Fil. Plant. Rar. fasc.* i. *p.* 9. *t.* 5. *Pall. Ross.* ii. *p.* 95. *t.* 87. *Willd. Sp. Pl.* ii. *p.* 1223. *Gært. Fruct.* i. *p.* 309. *t.* 65. *f.* 1. *Bot. Mag.* 926. *Hort. Kew. ed.* ii. *v.* iii. *p.* 316.
P. laciniis foliorum linearibus. *Zinn Cat. Got. p.* 127.
P. hybrida. *Pall. Ross.* ii. *p.* 94. *t.* 86. *Willd. Sp. Pl.* ii. *p.* 1223.

Radix tuberum fasciculus, surculis repentibus. *Caulis* sesquipedalis, valde foliosus, glaber. *Folia* triternata, multifida, glabra, ad apicem caulis aggregata, quibus flos quasi nidulatur. *Foliola* linearia subulata; radicalia nonnunquam lineari-lanceolata; hinc *P. hybrida* Pallasii. *Calycis foliola* glabra, integra, interiora orbiculata, mucronulata, exteriora acuta. *Folia* apud apicem caulis aggregata. *Corolla* minima saturate sanguinea. *Petala* 8, incurva, obovato-lanceolata, obtusa, apice erosa. *Germina* 2—3 raro 4, recta, approximata, demum patentiuscula, nec revoluta, villis purpureis dense vestita. *Stigmata* erectiuscula, rubra. *Semina* oblongo-elliptica, fusco-atra, lævia. *Floret* initio Maii.

Native of the Ukraine, between the Tanais and Volga, on hilly grounds and perpendicular banks of the Terec. Plentiful in the Taurian Chersonesus. It first appeared in Zinn's *Gottingen Catalogue*, published in 1757, and is admitted into the second edition of the *Species Plantarum* by Linné, who indulges in a fancy that one might imagine it was a bastard offspring of *Pæonia* and *Adonis apennina*.

The linear leaves are alone sufficient to characterize this species. The creeping surculi of its roots are also peculiar to it; and the small dark but bright red flower, supported on a very short peduncle and nestled as it were among the finely-divided leaves that crowd around the top of the stalk, together with the purple hairs which cover the germens, all sufficiently distinguish it from any other Pæony. It appears to have been introduced into this country by the late Mr. Malcolm, so far back as 1765.

P. hybrida of Pallas is not even a permanent variety. The sterile or rather the radical leaves in rich ground almost constantly assume a lineari-lanceolate form; indeed both descriptions of leaves are frequently produced on the same root. We have examined

mined many plants said to be seedlings, but never have discovered any perceptible variation in them.

5. PÆONIA OFFICINALIS.

P. foliolis inæqualiter laciniatis glabris, laciniis ovato-lanceolatis, germinibus rectiusculis tomentosis.

P. officinalis. *Pall. Ross. pars* ii. *p.* 93. *Retz. Obs.* iii. *p.* 35. *Smith Prodr. Flo. Græc.* i. *p.* 369. *Lamarck et Decand. Flo. Franc. v.* iv. *p.* 919. *Scopoli Carn. v.* i. *p.* 378. *Host Syn. p.* 66. *Willd. Sp. Pl. v.* ii. *p.* 1221. *Hort. Kew. ed.* ii. *v.* iii. *p.* 315. *Bot. Mag.* 1784.

P. officinalis *α*. *Linn. Sp. Pl. ed.* ii. *p.* 747.

P. communis vel fœmina. *Bauh. Phyt. n.* 4. *Pinax, p.* 323. *Morison Pl. Hist. p.* 454.

P. fœmina prior. *Dod. Pempt. p.* 195.

P. fœmina vulgatior. *Joh. Bauhin. v.* iii. *p.* 492.

P. fœminea, &c. *Ger. Em. p.* 981. *Lobel. Icones,* 682. *Park. Par. p.* 343. *Raii Hist. v.* i. *p.* 693.

P. fœmina foliis diffórmiter lobatis. *Mill. Dict.*

P. rubra flo. simpl. *Besler Eyst. ordo* vi. *p.* 15.

La Pivoine femelle. *Regnault Bot. Planche.*

Radicis tubera oblonga, obtusa, e fibris dependentia. *Caulis* simplex, 3—4-pedalis, flexuosus, glaber, nitidus. *Petioli* glabri, nitidi. *Axillæ* foliorum et foliolorum fuscæ. *Folia* glabra, interdum tamen subtus pilosiuscula, ternata. *Foliola* pinnata seu pinnatifida, intermedio quandoque decurrente, varie dissecta, bi- seu tri-partita, hinc integra. *Laciniæ* lato-lanceolatæ, modo fissæ, planæ, subconcolores. *Bractea* foliacea, ternata vel incisa, calyci approximata. *Corolla* magna, speciosa. *Petala* 7—8, incurva, obovata. *Germina* recta 2—3, tomento albo dense tecta, demum ferruginea. *Stigmata* semilunaria, fusca, marginibus flavis. *Semina* magna, ovata, parum corrugata, cœruleo-atra, splendentia. *Floret* medio ad finem Maii.

Native of the mountainous woods of Helvetia, Provence, Montpellier, Dauphiné, Piedmont, Carniola, the Grecian Islands, and most

most of the hilly regions in the south of Europe. Also on Caucasus and in Georgia (Pallas). Quer in his *Flora Espanola* states that it is frequent in Spain, particularly on the mountains of Avila.

The history of the present species may boast of a greater antiquity than that of most plants. There can be no doubt of its being the *Pæonia* of Pliny, to which such great medical virtues were attached.

Were we to trust to the double varieties, which are by much the most common in this country, we should conclude that this species was altogether free from pubescence; but on examining the single-flowered sorts, we find two out of three that have come under our observation slightly villous; so little reliance is to be placed on that property. Retzius is the only writer who has fully described this species, and his description is, in our opinion, without a fault. He has laboured perhaps over-much in defining the divisions of the leaf, which are so apt to vary, from soil and situation, as to baffle any such refinement of description. There are two specimens in the Cliffortian herbarium named *anomala*, which we take to be those of a variety of this species with narrower leaves than any we have seen elsewhere; they are certainly not specimens of *anomala*, for they have woolly germens, a decided mark of distinction between these two species.

We have been obliged to reject many synonyms, to prevent swelling the list to an unreasonable length. All the old herbals have noticed, if not figured, the "female peiony." We have inspected six distinct varieties.

α. Sabini; floribus atro-purpureis, foliis omnino glabris.

A few years ago no person knew that a plant of the single-flowered *P. officinalis* existed in this country. Mr. Sabine had the good fortune to discover one in the corner of an old garden at

Great Berkhampstead in Hertfordshire, where it possibly had remained undisturbed many years. The flowers are precisely of the same colour with those of the common double-red, but the petals expand a few days earlier. The leaves are less waved. The petals of all the single-flowered varieties are more inflexed than those of the pubescent species, being formed into the shape of a cup, contracted at the mouth. An abundant supply, of plants of this variety, has been imported from Holland since the peace, not differing materially from Mr. Sabine's plant. The figure in the *Botanical Magazine* was taken from one of those.

β. rosea; floribus saturate roseis, caulibus erectis.

This variety was observed by Mr. Sabine in the Oxford botanic garden, along with the plant that follows. We cannot obtain any account of their history: they have in all probability been very old tenants of that garden; perhaps since the days of Morison, in the latter end of the seventeenth century; nor do they seem to have found their way out of it, till Mr. Sabine was obligingly presented with roots of them by Professor Williams.

This has very broad undulated and obtuse leaflets, of a dark hue, tinged with red on the edges, and with a few slight hairs on the ribs of the under surface. Flowers of a pleasant rose colour; germens 2—3, densely tomentose, diverging at the apex. Stem erect, as tall as var. *α*, flowering a fortnight earlier, about the middle of May.

γ. blanda; floribus saturate roseis, caulibus laxis.

Obtained, as before mentioned, from the Oxford garden. The leaflets of this variety are likewise broad, though less so than the preceding; also much less undulated, and of a peculiarly pale green colour for a plant of this species: and, like those of the *rosea*, furnished with a few hairs on the back of the leaf. Stalks spreading; petioles reddish; flower of same colour and same time

of

of flowering as the preceding; germens generally three, upright at first and finally diverging.

Notwithstanding the partial pubescence observable on this and the preceding, we are in no kind of doubt in considering them mere varieties of the first-described and of the double-flowered varieties enumerated below.

δ. *rubra*; floribus plenissimis atro-purpureis. Double red Pæony.
P. femina polyanthos. *Lobel Ic.* 684.
P. polyanthos. *Camerarius Hort. p.* 114.
P. flore pleno rubro. *Joh. Bauh. v.* iii. *p.* 493.
P. fœmina flore pleno rubro majore. *C. B. Pinax, p.* 324. *Morison Plant. Hist. v.* ii. *p.* 455. *t.* 13.
P. fœmina multiplex. *Ger. Em. p.* 981. *Tabernæm. Ic. p.* 784.
P. fœmina vulgaris flore pleno rubro. *Park. Par. p.* 342 & 343. *fig.* 3.
P. officinalis rubra. Double red Pæony. *Sabine in Hort. Trans. v.* ii. *p.* 274.

To this variety we may apply the words of Besler; "vulgatissima est omnium Pæoniarum;" and we may add without exaggeration, the most splendid of all flowers. Even the fine double Pæonies from China, rich and magnificent as they are, cannot be compared for brilliance with this common inhabitant of almost every cottager's garden in England. Nothing but its extreme vulgarity and the extraordinary fœcundity of its roots could have brought this beautiful plant into the neglect it has suffered for a century past.

The first account given of it is in the edition of Lobel's *Icones*, 1581. Camerarius writes, in 1588, "id est flore pleno quæ ante paucos annos apud nos est cœpta coli;" from which we may conclude that it was at that time a recent discovery. The gar-

dens of Europe have been enriched with it, therefore, upwards of two centuries.

ε. *carnescens*; floribus plenissimis saturate roseis. Double flesh-coloured Pæony.

P. flore pleno incarnato. *Moris. Plant. Hist. v.* ii. *p.* 455.
P. officinalis carnescens. Double flesh-coloured Pæony. *Sabine in Hort. Trans. v.* ii. *p.* 275.

This beautiful variety is not of so old an introduction as the preceding. Morison gives us the first account of it, in 1699. The flower opens of a fine rose colour, and afterwards becomes pale flesh; it is not so common as the preceding, but nevertheless is too well known among the gardeners to require any further description.

ϑ. *albicans*; floribus plenissimis roseis. Double white Pæony.

P. fœmina polyanthos flore albo. *Tabern. Ic.* 785. *Ger. Em.* 982.
P. albo flore pleno, sive &c. *Joh. Bauh. v.* iii. *p.* 494.
P. fœmina flore pleno albicante. *Park. Par. p.* 342 & 343. *f.* 4.
P. fœmina flore albo pleno. *Moris. Plant. Hist. v.* ii. *p.* 455.
P. officinalis albicans. Double white Pæony. *Sabine in Hort. Trans. v.* ii. *p.* 275.

Tabernæmontanus records this variety in 1590; it therefore must have come into notice nearly about the same period as the double red. The flower of this bursts forth of a pale pink, and at length becomes almost quite white; is very common along with the double red in most of the old gardens, from which even neglect and bad treatment will not banish them.

6. PÆONIA CORALLINA.

P. foliolis distinctis ovatis planiusculis glabris, intermedio sublobato, folliculis recurvatis tomentosis.

P. co-

P. corallina. *Retz. Obs.* iii. *p.* 34. *Willd. Sp. Pl. v.* ii. *p.* 1221. *Engl. Bot.* 1513. *Hort. Kew. ed.* ii. *v.* iii. *p.* 315. *De Cand. Fl. Fr. v.* v. *p.* 643. *Smith Floræ Græcæ Prod. v.* i. *p.* 370

P. Mas. *Matthioli Comment. lib.* iii. *c.* 151. *Dod. Pempt. p.* 194. *Lob. Ic.* 684. *Tabernæm. Ic. t.* 784. *J. Bauh. v.* iii. *p.* 492. *Ger. Em. p.* 980. *Park. Par. p.* 341 & 343. *f.* 1. *Raii Hist. v.* i. *p.* 693. *Blackwell Herb. t.* 245.

P. Mas flore purpureo. *Besler Eyst. Vern. ord.* vi. *fol.* 10. 1.

P. officinalis, var. *β* mascula. *Linn. Sp. Pl.* 747.

P. officinalis. *Mill. Illustr.*

P. mascula. *Miller's Dict. ed.* viii. 1.

P. folio nigricante splendido, quæ Mas. *C. Bauh. Phytop. p.* 647. *Idem, Pinax, p.* 323. *Tournef. Inst. p.* 273. *t.* 146.

P. simplex latiore folio. *Moris. Oxon. v.* ii. *p.* 454. 1.

P. integra. *Murray in Commentat. Soc. Gætt.* 1784 & 1785, *v.* vii.

Radicis tubera numerosa, fusiformia, aggregata. *Caulis* bipedalis et altior, simplex, glaber, teretiusculus, rubicundus. *Petioli* communes longi, rubicundi ut in caule. *Folia* bi-triternata, vel ternata, pinnata, glabra. *Foliola* omnia distincta, nec confluentia; lateralia integra; intermedium sæpius bilobum, raro tripartitum, nonnunquam integrum; lato-ovata, planiuscula, subinde subundulata, plus minus reticulata, acutiuscula, supra saturate viridia, venis rubicundis, subtus pallidiora. *Calycis foliola* glabra, exteriora lanceolata, reliqua rotunda. *Petala* 5—6, integriuscula, ovata, concava, expansa, kermesina seu saturate rosea, venis coloris profundioris notata. *Germina* 3—4 raro 5, mollissime omnium tomentosa, primum rectiuscula, patentia, demum valde recurvata. *Follicula* matura aperta, longitudinaliter revoluta, seminibus atro-purpureis, plurimis abortivis phœniceis intermixtis, pulcherrime bullata. *Stigmata* revoluta, compressa, rubra. *Semina* ovata, lævia, illis *P. officinalis* minora. *Floret* a fine Maii ad initium Junii.

This is recognised as *P. mas* of Pliny and other ancient writers: upon what ground it obtained this title we cannot conjecture. It retained it, however, till Retzius, describing it for the first time scientifically, gave it that which it now bears. It is strange that Linné, who must have seen both plants, should persist in considering

dering this and *P. officinalis* as only varieties of the same species, no two plants in the whole genus being more distinctly separated.

The leaves of some varieties lately brought from Holland differ in being less or more pitted, but do not display any disposition to intermingle with other species. The leaves and stem are always quite free from pubescence in all our examples; though Ray, who copies John Bauhin, says that the leaves are "lanugine quadam aversa parte pubescentibus," owing possibly to the carelessness of old writing.

Native of mountainous woods in the south of Europe, as in the neighbourhood of Alais in Languedoc; frequent in Switzerland, and on the Alps generally: also on Mount Ida and in the island of Zante. Our claim to it as a native of Britain is perhaps but slender. It grows apparently indigenous on a small island in the Severn frith, called the Steep Holmes: and Gerard says that it grew wild in his time near Southfleet in Kent, but his editor Johnson unceremoniously observes that he planted it there himself.

7. PÆONIA DAURICA.

P. foliolis distinctis subrotundis undulatis obliquis integriusculis glabris, folliculis patentibus tomentosis.

P. daurica. *And. Repos.* 486. *Bot. Mag.* 1441. *Hort. Kew. ed.* ii. *v.* iii. *p.* 317.

P. triternata. *Pall. Ind. Plant. Taur. in Nov. Act. Petrop. v.* x. *p.* 312. *Georgi Beschr. des Russ. Reichs. v.* iii. *p.* 1050?

Radicis tubera crassa, oblonga, sessilia, fibrisque adnata. *Caulis* sesqui- bipedalis, suberectus, rigidus, flavo-virens, glaber. *Folia* figura præcedentis, persistentia, apice tandem sphacelata. *Foliola* inæqualiter rotunda, raro lobata, obliqua, valde undulata, supra flavo-virentia, subtus glauca, venis reticulata. *Petioli* abbreviati. *Calycis foliola* glabra, duo exteriora foliacea, reliqua orbiculata, cava. *Corolla* rosea, petalis circiter octo obtusis. *Germina* 2—4, flavescentia, dense tomentosa, demum patentia, vix reflexa. *Stigmata* rubra, recurvata. *Semina* fusco-nigra, sphærica, reticulata. *Floret* a medio ad finem Maii.

We

We believe this to be a discovery of Pallas, and that it is *P. triternata* of his Tour, and of Georgi's Description of the Russian Empire published at Kœnigsberg in 1800. The late Mr. Bell received seeds of it from Pallas prior to the year 1790: it is said to be a native of Siberia, but its native habitat is not precisely known.

Though in general habit a good deal resembling *P. corallina*, it is nevertheless essentially distinct from that species, in having its leaves always rounded, partially cordate, oblique, and much undulated; whereas those of the former are more or less pointed and nearly flat: the spherical, brownish-black, reticulated seeds, and the yellow tint of its leaves, stalks, and germens, would otherwise characterize it.

Its leaves are disposed to wither at the points and to remain longer on the stalks than those of the others. Its flower is of a pleasant pale rose colour. Among seedlings it is seen to vary in the degree of undulation of its leaves, but retains its essential character throughout.

8. PÆONIA HUMILIS.

P. foliolis tripartito-compositis lanceolatis acutis canaliculatis subvillosis, germinibus rectis glabriusculis, stigmatibus erectis.

P. humilis. *Retz. Obs.* iii. *p.* 35. *Bot. Mag.* 1422. *Smith in Rees's Cycl. Hort. Kew. ed.* ii. *v.* iii. *p.* 316.

P. hispanico semine nata. *Clus. Hist. v.* i. *p.* 279.

P. tenuis laciniata &c. *Bauh. Pin. p.* 323. 4. *Morison Hist. v.* ii. *p.* 455. 8.

P. fœmina pumila. *Ger. Em. p.* 982. 6, quoad Iconem.

P. fœmina hispanica pumila. *Park. Herb.* 1379. *Raii Hist. v.* i. *p.* 694.

Radicis

Radicis tubera numerosa, parva, elliptica. *Caulis* sesqui-bipedalis, flexuosus, angulatus, glaber. *Petioli* glabri, partialis medius lateralibus duplo longior. *Folia* biternata vel ternato-trifida, valde et inæqualiter incisa seu pinnatifida, supra saturate viridia, rugosiuscula, glabra, margine rubicunda: subtus glauca, villis obsoletis demum evanescentibus tecta, venis prominentibus glabriusculis; laciniæ lanceolatæ, apice attenuatæ, acutæ, incurvo-canaliculatæ, undulatæ, transverse reflexæ. *Pedunculi* sulcati, elongati. *Bracteæ* (una vel altera) integræ seusimpliciter fissæ, calyci approximatæ. *Calyx* glaber, foliis exterioribus planis, interioribus concavis muticis. *Petala* 6—8, eroso-marginata, parum laciniata, purpureo-sanguinea. *Germina* 2, raro 3, primo recta, leviter pubescentia, denique patentiuscula, glabra; folliculi maturi vix reflexi. *Stigmata* persistentia, elongata, erecta, apice reflexa (hujus speciei signum præstantissimum). *Semina* anguloso-ovata, atro-purpurea, lævia, splendentia. *Floret* initio Maii.

This species may be recognised with tolerable precision as that mentioned by Clusius, an acute observer and original writer, who described a great number of plants then unknown, which he observed in the countries visited by him towards the latter end of the sixteenth century. He discovered it in Spain; which is happily confirmed by our countryman Dr. Shuter lately returned from that country, who says he saw *P. humilis* growing abundantly on the mountains. It seems indeed to belong exclusively to Spain, unless it be what De Candolle considers a variety of *P. peregrina*, observed by him on the Serane mountains with smooth germens, and the segments of the leaves "*plus pales et plus allongés*," which we think highly probable. *P. lusitanica* of Miller, "with flowers of an agreeable sweet scent," cannot be reconciled with this or with any species we know. We suspect that Willdenow did not know this species, otherwise he could not have mistaken *P. paradoxa* var. β. for a double-flowering variety of it in his *Enum. Plantarum*.

The plant which we describe is probably an offspring from the seeds obtained from Spain through Clusius: how or when it came into

into this country is uncertain; possibly from the Dutch, who seem to have retained a taste for Pæonies long after they had got out of repute in this country. We found it in the nursery of Messrs. Chandler and Buckingham, at Vauxhall, who do not know from whence they obtained it. The figure in the *Botanical Magazine* is taken from their plant.

It is characterized by narrower, more subdivided and smoother leaves than those of any other species in the present subdivision. It differs too from the following in its smooth follicles, and from it and all other known species in the stigmas being elongated and almost upright, resembling styles; an important character, which Retz in his description, otherwise excellent, has altogether overlooked.

9. PÆONIA DECORA.

P. foliolis tripartito-laciniatis oblongis obtusis canaliculatis subtus pilosis, germinibus pubescentibus patentibus, stigmatibus recurvatis.

P. byzantina prior. *Clus. Hist. p.* 279.

P. peregrina flore saturè rubente. *Bauh. Pinax*, 324. *Raii Hist. v.* i. *p.* 696. *Moris. Hist. v.* ii. *p.* 455.

P. fœmina byzantina. *Park. Par. p.* 342 & 343. *t.* 2?

Radix præcedentis, tuberibus tamen paullo majoribus. *Caulis* erectus, bi- tri-pedalis, glaber. *Folia* biternata, caulina horizontalia, parum reflexa. *Foliola* (intermedium trilobum) lateralia sub-decurrentia, hinc interdum laciniata, oblonga, obtusiuscula, longitudinaliter canaliculata seu inflexa, minime undulata, glauca, non nitida, vix rugosa, margine rubicunda, subtus, ut et petioli partiales, parum pilosa. *Pedunculi* elongati, glabri. *Calyx* præcedentis. *Petala* circiter octo, parva, angusta, margine crispa, saturate kermesina. *Germina* 2—3, suberecta, pube albido læviter tecta, demum patentissima, rubicunda. *Stigmata* lunata, pallide-rubra. *Semina* ovata, atro-purpurea, lævia, splendentia. *Floret* ad finem Maii.

This and the three succeeding species are nearly allied to each other: it is, however, frequently a much easier task to determine

a species than to describe it. Being satisfied that they are distinct, we have endeavoured to give the best distinguishing characters that a close examination of three seasons has afforded us.

Our present plant we do not hesitate to refer to that which Clusius obtained from Constantinople; as the description which he and the succeeding writers give of it agrees with ours, and it also comes from the same quarter.

It is remarkable for the elegant stateliness of its habit. Each stalk accompanied by its horizontal leaves, diminishing as they ascend, and terminated by its flower, (which is rather smaller than is usual in the genus,) supported on a long peduncle, exhibits somewhat of a pyramidal figure. Its leaflets are constantly more or less longitudinally inflexed or concave: in this respect it resembles the last described, but differs from it in the leaflets being broad and obtuse. The follicles are less pubescent than those of the three following species, but more so than those of the preceding; they are very large, and at maturity diverge widely, but do not become so much recurved as those of *P. arietina*. We have only observed two varieties.

α. *Pallasii*; foliolis anguste oblongis.

Seeds of this plant were received by Messrs. Lee and Kennedy from Pallas, probably from the Crimea, where he spent the latter years of his life. The name he gave it, if any, has been lost; they called it *byzantina*: its flower has a fine deep rose colour, in shape and appearance not unlike that of *Papaver somniferum*; the seedlings came up without exhibiting any apparent variation.

β. *elatior*; foliolis lato-oblongis.

First observed in the nursery of Messrs. Chandler and Buckingham, who believe they got it from Holland. It differs from the preceding in the leaves being somewhat broader, and the plant

plant altogether more robust and rather more pubescent; unquestionably a mere variety.

10. PÆONIA ARIETINA.

P. foliolis trilobatis pinnatifidisque decurrentibus ovali-oblongis planiusculis subtus pilosis, folliculis tomentosis arcuato-patentibus.

Radicis tubera ut in præcedente. *Caulis* 2—2½-pedalis, suberectus, pilosiusculus. *Petioli* foliolis subæqualibus axillis pilosis. *Folia* pedalia, sub-biternata seu ternata, pinnatifida; foliola sparsim lobata, basi decurrentia, tunc inciso-dentata, integraque, ovata, obtusiuscula, rugosa, supra glabra, subtus glauco-pilosa. *Bracteæ* foliosæ, acutæ. *Calyx* basi pilosus; foliola duo exteriora acuminata, reliqua orbiculata, cava, obtusa. *Petala* mediocriter crispa, vix lacera. *Germina* 2—3, magna, tomentosa, primo patentia, demum arcuata, parum recurvata. *Stigmata* compressa, lunata, brevia, rubicunda. *Semina* ovata, nigra, rugosa. *Floret* a medio ad finem Maii.

This species is by much the largest among those of the present division. Its distinguishing characters consist in the leaflets being decurrent, often even confluent, and in the germens being arched and frequently recurved, suggesting a resemblance to rams'-horns: it seems to have been well known to the old authors, as will appear in describing the varieties.

α. Andersonii; floribus saturate roseis, petalis minus crispis.

P. promiscua Vormarii folio latiore. *J. Bauh. Hist. v.* iii. *p.* 493.
Raii Hist. v. i. *p.* 695. *Moris. Hist. v.* ii. *p.* 454.
P. byzantina major. *Besler Eyst. Vern. ordo* vi. *p.* 14?

This plant, to which Mr. Sabine gave the cognomen, owing to his having obtained it from me several years ago, though not common about London, probably having been banished with contempt for its single flower, is nevertheless still to be seen in remote parts of the country in the gardens of old baronial mansions: in such situations we knew it many years ago in Aber-

 deenshire,

deenshire, where it is still to be found under the name of the *Single Pæony*, and the only species with single flowers we ever observed in those parts.

We attach J. Bauhin's synonym without hesitation; his description of it, which Ray and succeeding authors have copied, being so applicable: "Folia siquidem quæ imis ramis hærent, latiora sunt quam cæterarum, rotundioraque; aversa parte glauca, hirsuta, adversa saturatius virentia itidemque pilis obsita; siliquæ retortæ, hirsutie alba totæ contectæ."

From analogy we presume it to be a native of the Levant. Its flowers are of a bright but deep rose colour, resembling most those of *daurica*, and appear very handsome over its abundant dark though glaucous leaves. Morison's figure, No. 3, is so bad that we cannot quote it.

β. *oxoniensis*; floribus carneis, petalis lacero-crispis.

P. cretica. *Clusius Plant. Rar. p.* 281.
P. folio subtus incano, flore albo vel pallido. *C. B. Pinax, p.* 323.
Moris. Hist v. ii. *p.* 454.
P. fœmina flore carneo simplici. *Park. Par. p.* 342.
P. mas major flore incarnato. *Besler Eyst. Vern. ordo* vi. p. 11.

This is probably No. 6. *Ger. Em. p.* 981, as to the description, "in our London gardens bearing flowers of a pale whitish colour, very single, resembling the female wilde Peiony;" although the figure of No. 6 is that of another species (*humilis*). And from Parkinson's notice of it we presume it must have been among the gardens in his days, though no where to be found three years ago in this country but in the Oxford botanic garden, where it seems to have existed unnoticed and unknown since the time of Morison, whose description of it is very satisfactory: "quam in horto alimus, cujus folia latiuscula lanugine alba utrinque obsita sunt.

Flores

Flores simplices primo emergentes, subcarnei, deinde in albos transmutantur." Mr. Sabine was indebted to the liberality of Professor Williams for roots of it from the Oxford botanic garden.

From Clusius we learn that this is a native of valleys on the highest mountains in Crete; which its habit confirms, having all that woolly-like softness in its young stalks and leaves so peculiar to the plants of that island. If it be *P. ochranthemos Camerarii*, it has been found in Navarre; but this last authority is not at all conclusive.

This is among the earliest of Pæonies; comes out of the ground of a pale glaucous green colour, destitute of the ruddy tint so common in the genus. Petals of a beautiful pale blush colour, crisp, and lacerated in a greater than usual degree. Follicles almost reflexed when ripe, less woolly and of a lighter colour than those of var. α. Roots of a Pæony have been imported by Messrs. Chandler and Buckingham from Holland which prove to be this plant.

11. PÆONIA PEREGRINA.

P. foliolis tripartito-laciniatis integrisque ovato-lanceolatis planiusculis subtus pilosis, germinibus tomentosis rectis.

P. peregrina. *Hort. Kew. ed.* ii. *v.* iii. *p.* 315. *De Cand. Flor. Franc. v.* v. *p.* 643.

P. peregrina flore coccineo. *Besler Eyst. Vern. ordo* vi. *p.* 9.

P. peregrina foliis diffomiter lobatis &c. *Mill. Dict. ed.* viii. 3.

This species is involved in much obscurity among the old authors; and since it has been restored by modern writers, no detailed description of it has yet been published. For several years successively we have examined three plants, each of them differing considerably from the other, and they prove to retain unchanged

unchanged their respective habits. It is not possible, however, in the present state of our information, for us to pronounce whether these be specifically distinct or not; and we deem it expedient, in order to pave the way for a subsequent decision on this point, to give a separate description of each, as we have observed it.

P. peregrina, De Candolle informs us, is a native of the mountains of Provence and Languedoc, chiefly near Montpellier; also abundant on the mountains La Serane and Pic St. Loup, and in the forest of Valene; but which of our plants, (or whether all three together) is intended by him, unfortunately his defective description denies us the means of judging. It also belongs to the Levant, as will afterwards appear. Bulliard, vol. iii. p. 300, we think refers to it; but his description is bad, and his figure worse.

α. byzantina.

P. peregrina. *Bot. Mag.* 1050.
P. byzantina altera. *Clus. Hist.* 279.
P. peregrina flore dilute rubente. *C. B. Pinax, p.* 324.
P. pomi aurantii colore. *Morison Hist. v.* ii. *p.* 455; exclus. syn.

Radicis tubera fibris brevibus adnata, numerosa, teretia, oblonga. *Caulis* bipedalis et ultra, erecto-flexuosus, pilis albis tectus. *Folia* biternata, læte seu dilute viridia, petiolis glabriusculis. Foliolum intermedium trilobatum, raro ternatum, hinc varie et profunde incisum seu pinnatifidum, basi decurrens. Lateralia integra nonnunquam bilobata, basi obtusiuscula. Laciniæ planiusculæ tamen subundulatæ, ovatæ, obtusiusculæ, minus rugosæ, sinubus rubentibns; subtus cano-pilosæ, supra glabræ, sed non nitidæ. *Bracteæ* frondosæ, integræ, calyci approximatæ. *Calycis foliola* exteriora bracteis non distinguenda, inferiora obtusa, glabriuscula, margine rubicunda. *Petala* 8, integriuscula, obovata, apice erosa, kermesina. *Germina* 2, rarissime 3, cano-tomentosa, primo congesta demum divergentia, triplo minora quam *P. arietinæ*. *Semina* ovato-oblonga, acuta, nigra, lævia, splendentia. *Floret* medio Maii.

Clusius received seeds of a Pæony from Constantinople in 1588; his

his description of which, under *P. altera*, accords with the present plant: it may therefore be considered as a native of the Levant. If our quotation from Morison be correct, it must have been an old tenant of our gardens, although it is not now commonly to be seen. Our plant was obtained from Kew, the same from whence the drawing was taken for the *Botanical Magazine*.

This plant is remarkable for the pale grass-green colour of its leaves, which Clusius and Morison both take notice of; these are much divided, and covered underneath with white hairs. It comes into flower a little later than *arietina*, from which it differs in the leaflets being more obtuse at the base, seldom decurrent, in the whole plant being considerably smaller, and in the germens being straight and erect.

If the oblong shape of the seeds be a permanent character, it alone would be sufficient to distinguish it as a separate species.

β. compacta.

Radicis tubera minora quam *α*. *Caulis* sesquipedalis. *Folia* biternata, saturate viridia, lato-ovata, plana nec undulata, minime rugosa, crebre laciniata, laciniis apice obtusissimis; foliola lateralia trilobata seu ternata, conferto-imbricata. *Calyx* basi pilosiusculus; foliola exteriora frondosa, incisa. *Germina* duo. *Semina* rotundata, nigra, lævia, splendentia. (Cætera ut in præcedente.)

Found in the nursery of Messrs. Lee and Kennedy under the name of *anomala*: but we are unable to obtain any account of its origin; nor can any notice of it be discovered among the authors, only that, as it corresponds sufficiently with De Candolle's description, and having traced the foregoing plant to Constantinople, we might conjecture that this comes from the south of France. It is probably a distinct species. It differs from *paradoxa*, which it much resembles, in the fissures of the leaves being deeper though nearly equally obtuse, petals entire, calyx pubescent, and germens scarcely ever more than two, besides its being

being nearly a fortnight earlier in flowering. This plant is remarkable at first sight by its general compact bushy habit, and by its broad flat dark glaucous-green leaflets; not yellowish-green nor bordered with red, like the foregoing.

γ. Grevillei.

Radix præcedenti similis. *Caulis* bipedalis, glabriusculus. *Folia* biternata; foliola profunde laciniata, valde undulata, interdum tortuosa, angustata, acuta, rugosa, glauca, margine rubicunda. *Calyx* glaber; stigmata acutiuscula; semina rotundata. (Cætera ut in var. *α*.)

Obtained by Mr. Sabine from the garden of the late Mr. Greville, who cultivated it as a new species, but whence it originally came he could not learn. We found the same plant in Messrs. Lee and Kennedy's nursery, without any name; its history is equally ambiguous with the preceding, but it may be supposed to have come from the same quarter. It is conspicuous by its deeply and numerously laciniated leaflets, which are glaucous, very much undulated, and sometimes twisted. It comes into flower rather earlier than the other two; petals deep crimson, not so dark as those of var. *α*.

12. PÆONIA PARADOXA.

P. foliolis multipartitis obtusis undulatis, subtus glauco-pilosis, germinibus adpressis tomentosis.

P. promiscua seu neutra. *Lobel Ic.* 683.
P. promiscua strictiore folio. *J. Bauh. Hist. v.* iii. *p.* 493.
P. fœmina altera. *C. Bauh. Pin. p.* 323.
P. byzantina minor. *Besl. Hort. Eyst. Vern. ordo* vi. *p.* 14.?
P. promiscua. *Ger. Em. p.* 982. 5. *Raii Hist. v.* i. *p.* 695.
P. peregrina. *Smith in Rees's Cycl.*: absque synonymis.

Radix ut in præcedentibus, tuberibus vero angustioribus et paulo magis sparsis. *Caulis* vix sesquipedalis, glabriusculus, simplex. *Folia* biternata, præcedente minora, foliola trilobata, varie et inordinate incisa, nonnunquam ternata. Laciniæ sæpius bifidæ aut

aut trifidæ, fissuris brevibus, obtusis, confertæ, imbricatæ, planiusculæ, tamen subundulatæ, margine rubicundæ; supra glabræ, rugosæ, saturate virides; subtus cæsio-pilosæ. *Foliolum* intermedium quandoque decurrens; lateralia basi obtusissima, rotundata. *Petioli* glabri. *Bracteæ* integræ, lanceolatæ, hinc incisæ, seu bilobæ. *Calyx* glaber, foliolis tribus exterioribus foliaceis, acutis, reliquis orbiculatis parum retusis. *Petala* 8, obovata, lacera, interdum bifida, patentia, violaceo-kermesina. *Germina* plerumque duo, rarius tria, erecta, adpressa: folliculi maturi tamen patentiusculi. *Styli* angusti, hamato-reflexi. *Semina* nigra, spherico-ovata, exigua, lævia, splendentia. *Floret* initio Junii.

From a general coincidence we conclude this to be the *P. promiscua* of the old authors. Both the varieties we believe came originally from Holland at some early period. It appears to be a native of the Levant.

This is the latest in coming into flower of all Pæonies, excepting *albiflora*; its flowers seldom expand before the latter end of May: it forms a dense tuft of leaves and flowers, more dwarf than *humilis*, and is the lowest in stature of all the species excepting *mollis*.

From *peregrina* it differs in the leaves being small, ovate, and more glaucous; the leaflets more divided, crowded, and imbricated; the ultimate fissures shallow and obtuse; in the germens being close pressed together, and very little separated even in the ripe follicles.

These considerations, together with the uniformity of character in the two varieties, which both flower a fortnight later, have induced us to remove them from *peregrina*: future observation may decide whether our judgement be correct. Our learned President, who must have had this plant before him in describing *P. peregrina* in *Rees's Cyclopædia*, observes with his usual correctness, that it does not accord with *P. peregrina flo. coccineo* of Besler, the figure of which is that of our *peregrina*; nor with *byzantina* of Gerard and Parkinson, which is our *decora*.

α. *simpliciflora*; caule omnino glabro, floribus 8-petalis.

To be found in most of the nurseries, under the mistaken name

of *humilis*: the follicles are of a paler green than in *peregrina*; petals a dark purplish-red, often bifid, or a little lacerated.

β. fimbriata; caule vix pilosiusculo, floribus plenis.

P. flore pleno rubro minore. *C. Bauh. Pin. p.* 324.

P. flore pleno rubro, minor. *J. Bauh. v.* iii. *p.* 493. *Raii Hist. v.* i. *p.* 696.

P. foliis difformiter lobatis pubescentibus. *Mill. Fig. of Plants*, 199: *mala.*

P. flore pleno purpurascente papaverino. *Moris. Hist. v.* ii. *p.* 455. *et Sect.* xii. *tab.* 1. *fig.* 17.

P. humilis. *Willd. Enum.* 572.

P. paradoxa fimbriata. Double fringed Pæony. *Sabine in Hort. Trans. v.* ii. *p.* 276.

Messrs. Lee and Kennedy have long possessed this plant; and Messrs. Loddiges and Son imported it from Holland under the name of the double-purple Pæony. It is the only plant among the pubescent species with double flowers. These are of a beautiful purplish crimson, smaller in size, and with the inner petals more linear and divided than those of the double varieties of *P. officinalis*, giving it the appearance of a fringed tassel. It accords in every material circumstance with the single-flowered plant.

13. PÆONIA MOLLIS.

P. foliolis ovali-lanceolatis planis lobatis imbricatis subtus cæsio-pilosis; lateralibus subsessilibus; germinibus tomentosis rectis.

Radicis fibræ longæ, tuberibus longis desinentes. *Caulis* pedalis et ultra, rigidus, strictus, pilosiusculus, dense foliosus. *Petioli* breves, supra glabri, subtus pilosiusculi; partiales undique pilosi. *Folia* dodrantia, inæqualiter subtriternata, complanata, horizontalia, saturate cœruleo-viridia. *Foliola* lateralia subsessilia extus decurrentia, profunde lobata, lato-lanceolata, plana, obtusa, congregata seu imbricata, venis fuscis parallelis, subtus dense pilosa, glauca; supra glabra, nitidiuscula. *Bracteæ* foliaceæ, integræ et incisæ. *Calycis foliola* obtusa, exteriora pubescentia, integra. *Germina* 2—3 rectiuscula, adpressa, apice distantia, molliter pubescentia, pilis ferrugineis. *Semina* æqualiter ovata, rugosiuscula, nitida. *Floret* a medio ad finem Maii.

This

This species is entirely unrecorded. It was raised by Messrs. Loddiges and Sons of Hackney, from seeds obtained from Pallas, and said to be from Siberia; although from its appearance we should rather suspect it to have come from the Crimea, where that respected naturalist spent the latter years of his life. From Messrs. Loddiges it has found its way into the gardens of the curious under the mistaken name of *anomala*. We distinguished it three years ago in Mr. Sabine's collection as a truly distinct species; and it has been reserved for us first to describe it.

This plant is at first sight distinguishable from its congeners by its short, rigid, upright stalks, the dark blueish-green colour of its leaves, which are flat, compact, very much divided, the laciniæ crowded, overlapping each other, very woolly on the under-side, nowise bordered with red as in most of the others, and the lateral leaflets being almost sessile, the exterior side of each disposed to be decurrent. It is the most dwarf of all our species, seldom reaching eighteen inches in height even in our gardens. The stalks as well as the primary petioles are nearly smooth. The flower is small, of a dark dull purplish-red, by no means handsome.

POSTSCRIPT BY JOSEPH SABINE, Esq.

Two days after the preceding account had been brought to its present state, by the diligence and industry of my most valued friend, he was accidentally killed by a fall from a carriage. This melancholy event happened on the 10th of January last, near his own house at West-Ham; and the superintendence of the publication of this paper in consequence of this misfortune has fallen on me alone: thus the gratification I had enjoyed in assisting him in the composition, and which would have been complete had we been

able to see the result of our inquiry placed in the pages of the *Transactions* of the Society, was suddenly destroyed; and that which would have afforded me so much pleasure, has now been a task, accompanied with the most painful recollections.

To those who had the happiness of being acquainted with Mr. George Anderson, it will not be necessary to recall the recollection of his merits and of his goodness; his loss has been most severely lamented by his friends, and the remembrance of his virtues and of his excellence will remain in their hearts to the latest period of their lives. The science of Botany in this country, had he not been so early lost, would probably have been considerably benefited by his labours. He had devoted much time and minute attention to the investigation of the genus *Salix*, the species of which he had examined with the greatest care; and having formed a most extensive collection of them, he had made such progress in their arrangement as would have enabled him, had he lived, ere long to have communicated to the public a very accurate and correct account of the whole. His inquiries were not, however, confined to this subject only; his knowledge of English plants was accurate and extensive, and his diligence and perseverance in the search after rare and new native species very remarkable. With all the different hardy bulbous plants he was particularly well acquainted, and had acquired a knowledge of the species and varieties of the extensive genera of *Crocus*, *Narcissus*, *Tulipa*, *Hyacinthus*, and *Lilium*, from the examination of them under cultivation in his own garden, which probably no individual who survives him possesses.

I have not ventured to alter or to add to any part of the preceding paper; the examination which I was enabled to make of the Pæonies during the last summer, has given me no reason to doubt the accuracy of any of the observations for which we were jointly

jointly responsible: it is possible, I think, that new varieties may be discovered, and that future investigation may add to the references which we have given; the work cannot be considered as complete, whilst any synonym of those authors, who described what they actually observed, remains unapplied; such additions, if they be thought worthy of notice, shall be given hereafter in a supplemental paper, should health and leisure be allowed me.

The first volume of M. De Candolle's *Systema Naturale Regni Vegetabilis*, which has just arrived from Paris, contains the genus Pæonia; and as that work must, from its peculiar merit and from the great repute of its author, be constantly referred to as authority, it will perhaps be considered not entirely useless to compare the species of our paper with those of M. De Candolle, and to endeavour to reconcile the points of apparent difference. He has not arranged his species in the order which has been adopted in our paper, but placed them in the following succession: 1. *Moutan*; 2. *Corallina*; 3. *Officinalis*; 4. *Peregrina*; 5. *Lobata*; 6. *Daurica*; 7. *Albiflora*; 8. *Tatarica*; 9. *Humilis*; 10. *Anomala*; 11. *Hybrida*; 12. *Tenuifolia*; 13. *Laciniata*.

In *Moutan* he has made the double one the type of his species, and under that has referred to our two double varieties; placing *P. papaveracea* as the second variety, and suggesting the possibility that it may be a distinct species.

Of *P. albiflora* he makes two varieties only; his *α*, judging by the reference to *Andr. Repos.* 64, is our *P. albiflora α. vestalis*; his *β. flore roseo* is our *P. albiflora γ. Tatarica*, as I conclude from his reference to *Par. Lond.* 78, though the plant there figured is described as having "petala *pallide rosea*," whilst that with "petala *rosea*," therein noticed as another variety, is either our *P. albiflora ε. rubescens*, or one which, if ever it did exist in our gardens, is now lost. M. De Candolle's reference to the *Hortus Kewensis*,

Kewensis, 2d edit. in this species is only to the var. β, as if that alone was noticed therein; whereas *P. albiflora* of the *Hortus Kewensis* is referable to the species itself; and the variety figured in the *Par. Lond.* is the second variety β. of *P. albiflora* in the *Hortus Kewensis*. M. De Candolle has no references to the figures in the *Botanical Magazine* or the *Botanical Register*; and I conjecture that he is not acquainted with more than the one double variety, *P. albiflora* β. *Whitleji*, to the figure of which in *Andr. Bot. Repos.* he refers.

Our two species *P. anomala* and *P. tenuifolia* agree with those of M. De Candolle; but he has kept as a distinct species *P. hybrida*, adding to the statements of Pallas, the authority of Dr. Fischer, who in his correspondence has assured him he found it growing on the northern side of Mount Caucasus, and that it was not an hybrid plant, but a genuine species. Being fully satisfied that Pallas's plant, figured and described in the *Flora Rossica*, and which was from a cultivated specimen, is only *P. tenuifolia* in a state it sometimes assumes, but different from what it usually puts on, I must still continue my opinion of their identity. In Dr. Fischer's Catalogue of the Garden at Gorinki near Moscow, printed in 1808, he does not enumerate *P. hybrida*. Should this plant, however, after more investigation, prove distinct from *P. tenuifolia*, I shall rejoice in the circumstance, as our list of species of this charming genus will thereby be increased; but if *P. hybrida* be distinct, it cannot be set down as one now cultivated in this country.

P. officinalis, on the authority of several French authors, has been considered hitherto a native of different parts of France: it seems from the personal observation of M. De Candolle, most probable that other species have been mistaken for this; and I should not be surprised, if subsequent examination of specimens

from

from the natural habitats, should very much reduce the number of synonyms of modern writers which have been hitherto applied to this species, and that by this operation the native places of growth of those new species described by us from cultivated plants only, should be discovered. One reference of M. De Candolle, viz. that to "*Saku Jaku, Kæmpf. Amæn.* v. *p.* 862," I must consider as very doubtful: the result of every inquiry I have made is, that only *P. Moutan* and *P. albiflora*, with all their varieties, are cultivated in China and Japan; the *Botan* of Kæmpfer is the first of these species, and I believe the *Saku Jaku* is a variety of the latter with single red flowers, and that the two double varieties of the same, mentioned by Kæmpfer, are our *P. albiflora Whitleji* and *P. albiflora fragrans.*

P. corallina is now so well known that no doubts can exist about it, or the synonyms referable to it. M. De Candolle has confirmed our belief, that *P. daurica* is the *P. triternata* of Pallas and Georgi: and *P. humilis* is so well settled by the authority and accuracy of Retz, that no difficulty can exist relating to it.

The synonyms which we have applied to our *P. decora*, are all referred by M. De Candolle to his *P. lobata*; and I am inclined to think they are the same, though from the circumstance of his plant being quite smooth in the leaves, and ours being hairy underneath, they must, if brought together as a species, remain as distinct varieties: in all other points, except this one, they agree. As the *P. lobata* is cultivated in France, and as Mr. MacLeay has got a plant of it from Paris in his garden, the question will be probably settled in the next summer.

With our *P. arietina* M. De Candolle seems to be quite unacquainted; the synonyms of Bauhin and Morison, applied by us to *P. arietina* α. *Andersonii*, are referred with a mark of doubt to his *P. peregrina*; whilst those of Clusius and Bauhin, which we have

have quoted as referable to *P. arietina β. Oxoniensis*, make one of his unknown Pæonies.

The next species, *P. peregrina* of our paper, I cannot refer to that, to which the same name is applied by M. De Candolle in his present work; relying on the reference in his *Flore Française*, to the figure in the *Bot. Mag.*, we had considered the *P. peregrina* of his work as our species; but in the *Systema Naturale Regni Vegetabilis* the *P. peregrina* of the *Hort. Kew.* and of the *Bot. Mag.* (of the identity of which plant we are quite certain) is made the variety *γ.* of his species; and this variety must hereafter be referred to as a synonym of our *P. peregrina α. Byzantina*: with our two other varieties of *P. peregrina*, viz. *compacta* and *Grevillei*, I must suppose M. De Candolle to be unacquainted; it then remains for me to find a place for the varieties *α.* and *β.* of his *P. peregrina* in our arrangement. We have concluded that our *P. paradoxa* is the *P. promiscua* of the old authors, of Lobel, Gerrard, and John Bauhin. To this plant of these writers, as well as to the *P. altera sive neutra* of Caspar Bauhin, we on examination of the living plant referred that species. M. De Candolle, with his plant (a native of France, found by himself,) before him, has referred it to the same authors: our description of the plant exactly accords with his, and particularly agrees in the circumstance of its low growth. The only difference which prevents my coming to a decided conclusion in the identity of the two is, that M. De Candolle, in his specific character, has "capsulis tomentosis basi erectis *apice divergentibus*," whilst the corresponding part of our specific character is "germinibus *adpressis* tomentosis," the divergence of the germens being one of the points by which our *P. peregrina* is distinguished from *P. paradoxa*. Notwithstanding this difficulty, I think it will turn out that our *P. paradoxa* is the *P. peregrina α.* of M. De Candolle; but we must wait for specimens or plants from

France

France to settle the matter decidedly. Of M. De Candolle's *P. peregrina* β. "ovariis glaberrimis," we have hinted our belief that it might be referred to *P. humilis*: M. De Candolle, in his *Flore Française*, suspected it to be *P. peregrina* in an unhealthy state, and not a variety, which I am inclined to think very likely. If it be a distinct variety, I certainly never have had it under examination.

I have now compared all the species described in our paper with those of M. De Candolle, except *P. mollis*, which being quite a new plant, unknown in France, and not described before by any author, was not likely to have been noticed by him. His *P. Moutan*, *P. corallina*, *P. officinalis*, *P. Daurica*, *P. albiflora*, *P. humilis*, *P. anomala*, and *P. tenuifolia*, are the same as our species so called: his *P. peregrina* I think is referable in its varieties to our *P. paradoxa* and *P. peregrina*; his *P. lobata* I believe to be our *P. decora*; and I am ready to admit *P. hybrida* as distinct from *P. tenuifolia*, when the evidence of its existence is confirmed; our *P. arietina* and *P. mollis* are decidedly new. It therefore only remains to notice two additional species enumerated by M. De Candolle as doubtful ones; viz. *P. Tatarica* and *P. laciniata*, both of which I conceive must be withdrawn from the list of genuine species.

He appears to have been induced to notice *P. Tatarica* solely on the authority of Miller, the plant not being otherwise known to him, for he only refers to *Miller's Dict. no.* 5, and *Miller's Ic. t.* 199. Miller says this plant was raised from seed obtained from the Levant, and that there is a double and single variety of it, the figure in his *Icones* being intended for the double one. M. De Candolle, on the authority of Miller, calls it a native of Tartary, but I cannot find any statement in *Miller's Dictionary* to justify this supposition. Miller's *P. Tatarica* is however our *P. paradoxa*,

P. paradoxa, as such we have referred to his figure, in the synonyms of the double variety; and our *P. paradoxa* I have before stated to be in my opinion the *P. peregrina* α. of M. De Candolle.

The *P. laciniata* in like manner is founded on a single authority only, that of Willdenow's *Enumeratio*. Willdenow's plant came from Siberia; and it might be suspected that he had got Pallas's *P. laciniata*, which is the *P. anomala* of Linnæus and all subsequent writers, and had erroneously considered it distinct, being misled by the name, but that he describes it "capsulis tomentosis." This circumstance (since it cannot be admitted that it is another species, or it would have found its way to other collections from the Berlin garden,) makes it probable that Willdenow's *P. laciniata* was only a strong-growing plant of *P. tenuifolia*, perhaps in the very state figured by Pallas as *P. hybrida*. M. De Candolle has described his *P. laciniata* with "capsulis tomentosis *patentibus*;" the addition of this latter term not being a part of Willdenow's description.

North Mimms,
20th December, 1817.

THE

TRANSACTIONS

OF THE

LINNEAN SOCIETY

OF

LONDON.

VOLUME XII.

PART THE SECOND.

MISSOURI
BOTANICAL
GARDEN.

LONDON:

PRINTED BY

RICHARD AND ARTHUR TAYLOR, SHOE-LANE:

SOLD AT THE SOCIETY'S HOUSE, NO. 9, GERRARD-STREET, SOHO;

AND BY LONGMAN, HURST, REES, ORME, AND BROWN,

PATERNOSTER-ROW.

MDCCCXVIII.

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TRANS-

XVII. *Observations on the Linnean Genus* Juncus, *with the Characters of those Species, which have been found growing wild in Great Britain. By James Ebenezer Bicheno, Esq., F.L.S.*

Read June 18, *Nov.* 5, *and Dec.* 3, 1816.

Of all the objects to which the pages of the Linnean Transactions have been devoted, none has contributed more to the progress of science than the monographs which have appeared of the different genera of animals and plants. With a view, therefore, of contributing a small share to the labours of the Society, I have ventured to communicate a few remarks for the purpose of elucidating the obscure and uninviting genus *Juncus*: for though an inaugural dissertation has been dedicated to the subject by Rostkov, intitled "*Monographia Generis Junci, cum Tabulis binis æneis,*" *Berolini*, 1801, it is a work not to be found in any of our botanical libraries; and, though containing much useful information, does not supersede the necessity of a further illustration of the genus. His arrangement of the species is indeed altogether unnatural and objectionable, as he has brought together into close connexion some of those which have the most distant relation in the whole genus. The French botanists have commemorated the author by naming after him a new genus, naturally related to the objects of his essay.

The old herbalists seem to have had no other character for the *Junci* than their grassy appearance, and their internal spongy structure. This comprehended an heterogeneous assemblage of

plants of various genera, e. g. *Scirpi*, *Schœni*, *Cyperi*, *Triglochines*, *Butomus*, *Eriophora*, and others. Nevertheless, with all this confusion, they divided the real *Junci*, which are included in the first subdivision of the genus in the *Species Plantarum*, into two families, the *hard* and the *soft*; the former being all called *acutus*, and the latter *lævis**. The *Gramina hirsuta*, which are those *Junci* described as plane-leaved by Linnæus, were kept entirely distinct, and were arranged among the Grasses.

Our systematic countryman Ray gives this description, "de Junco et Gramine Junceo†:"—"Juncus caulibus teretibus, fungosis, panicula vel in summo caule existente, vel ex ejus latere inferius exeunte, et multis seminibus majusculis compositâ à reliquis graminifoliis distinguitur. Gramina juncea à juncis distinguuntur caulibus foliosis articulatis. Folia etiam in his non semper teretia sunt, sed in nonnullis speciebus compressa, in omnibus tamen fungosa." The latter part of this description alludes to such as have jointed leaves: but Ray confesses that he has admitted under his definition, in conformity to the opinion of other botanists, plants which he did not know how to dispose of otherwise. He has placed the *Gramina hirsuta* in a distinct division. In the second edition of his *Synopsis*, the *Gramina juncea* are said to differ merely in their having a leafy stem. Ray's definition, it must be confessed, very much lessened the number of plants which were at first admitted, though it still embraced the *Eriophora*, *Triglochines*, and some of the *Schœni* and *Scirpi*. No improvement of the character appears, as might be expected, in the *Methodus Graminum*, published afterwards; but on the contrary, it is more loosely defined. Dillenius, in his edition of the *Synopsis*, introduced considerable correction both in the character of the genus and the synonyms, and the true *Juncus* is

* *Bauh. Pin.*, p. 11. † *Historia Plantarum*, p. 1302.

thus

thus described: "Calyce hexaphyllo, staminibus totidem, quot sunt calycis folia, et semine multo in vasculo seminali recondito a Scirpo differt*." The species are also divided into those which are *leafy* and those which are *leafless*.

Scheuchzer and Haller have included the *Gramina juncea* and the *Gramina hirsuta* in their *Juncoides*, rejecting at the same time from the former family the *Eriophora* and some other genera which Ray had retained. The real *Junci*, such as *acutus*, *glaucus*, *effusus*, &c. rank under a separate division, with this definition: "Flosculi hexapetali, rosacei, sex scilicet petalis in orbem positis constantes."—"Vascula seminalia triquetra aut ex triquetro rotundata, trivalvia, septoque per medium cujusque valvæ longitudinem procedente, in tria loculamenta divisa, seminibusque plurimis plerumque, ac minutissimis repleta, a *Juncoide* autem specialiter differt, scirpis teretibus, prorsus enodibus†," &c. Tournefort, whose attention was chiefly arrested by the corol, has included in his character all three of these strongly-marked families, because he found their petals, otherwise called the leaflets of the calyx, to correspond. The penetrating Micheli, however, led more by the internal structure of plants, adopted two distinct genera; the first, *Juncus*, which he describes as having a trilocular, many-seeded capsule; the other, *Juncoides*, with a unilocular, three-seeded capsule. The great Linnæus, guided by Tournefort, re-joined them; and at the same time adopted in his generic character the peculiarity of the *Gramina hirsuta*, as being unilocular; —by which inconsistency the real *Junci* are all excluded! Jussieu does not describe the cells in his generic definition; but at the head of the natural family he calls them trilocular.

The *Gramina hirsuta* seem to have been first taken up by J. Bauhin under the name of *Luzula*. Cesalpinus calls the *Jun-*

* *Raii Syn.* 3d ed. 431.

† Scheuchzer's *Agrostographia*, p. 337.

cus campestris, Linn. "Herba Luziola vulgo;" and the reason, as Gerard informs us, is, that the heads of the flowers shine in the night; "wherefore in Italy they call it *Luciola quia noctu lucet.*" Tabernæmontanus and Ruppius call the family *Cyperella*; Scheuchzer, Haller, and Micheli, *Juncoides*; Willdenow (*Hort. Berol.*), Lamarck and Decandollc (*Flor. Franc.*), and Dèsvaux, have established the genus under the name of *Luzula*. The last-named botanist has published a paper on the subject in the *Journal de Botanique*, *vol.* i. *p.* 131; and the alteration has been recognised by our own learned and indefatigable countryman, Mr. Brown, in his *Prodromus Floræ Novæ Hollandiæ*. The different habit and striking character of the two families would have been enough to have caused their separation; but, sanctioned by these weighty authorities at home and abroad, it can no longer be a subject of doubt.

In distinguishing the species of *Luzulæ*, I have derived great assistance from observing the shape of the seeds, and of what I have ventured to call the *Coruncula*, attached to them; the figure of which, if well observed, will set at rest any hesitation that may exist about the British species. The same appendage is incident to many of the real *Junci*, and may be particularly remarked in *J. acutus*, *maritimus*, *triglumis*, *castaneus*; and in the foreign *J. grandiflorus*, Linn., now made a new genus by Desvaux, on account of this striking character, under the name of *Marsippospermum*. The seeds of *Narthecium ossifragum*, which is nearly allied to the plants under discussion, have an integument of the same nature.

Besides the attempt to adopt a new genus into the *British Flora*, I have given in the following pages what I conceive to be amended characters of all the species of *Juncus* and *Luzula* yet discovered in Great Britain; and have added some few new ones, which were either imperfectly known, or regarded only as varieties.

varieties. The synonyms I have introduced are not numerous; but they have been collated with care, and I trust may be relied on.

The Linnean genus *Juncus* includes a great variety of species. In the third edition of the *Species Plantarum*, eighteen are described, besides a great number of varieties. Murray has twenty-two; Gmelin thirty-five; Lamarck, in the *Encyclopedia Methodique*, thirty-two; Willdenow, forty; and Rostkov, fifty-two. Almost all the new ones belong to the true *Junci*; and it is fortunate for science that so numerous a tribe may be so naturally and easily subdivided: 1st, into those with LEAFLESS STEMS, including the original and true Rushes, beginning with *Juncus acutus* and ending with *J. filiformis*: 2dly, Such as have CHANNELLED LEAVES, embracing among the British species the Linnean *bulbosus*, *bufonius*, *trifidus*, and *uliginosus*; *J. squarrosus* belongs to this series, but does not follow any other species with a very close affinity; *J. trifidus* connects itself with the *leafless* subdivision by its entire want of leaves in some situations, and in some degree with the *Luzulæ* by its fimbriated scales: it is nearly allied to *uliginosus*, with which it is linked by the *supinus* of Hoffman and Don's *Herbarium Britannicum*: 3dly, Those with JOINTED LEAVES succeed, a most distinct and natural family, connected with the last subdivision by *J. triglumis* and *biglumis*, which have cellular-knotted leaves, and ending in the new species, which were included by Linnæus in his *articulatus*. This series, in order to connect it with the former, begins with those which are least complete in the joints of the leaves, and ends with such as have the most distinct and perfect articulations. It would seem, indeed, as if the channelled leaves of this genus were imperfect articulate leaves.

It is necessary to add a word or two in explanation of some terms I have used in my descriptions differently from some other botanists.

botanists. That which they have denominated the leaves of the true *Junci*, beginning with *glaucus* and ending with *filiformis*, I have regarded as barren stems, and for these reasons:—the species which are most nearly allied to them, having leaves, produce them from a membranous integument sheathing the base of the stem, as in *J. acutus* and *maritimus*. They are generally indeed setaceous, channelled, and of a totally different appearance from the culm which they accompany. Examples may be found in their congeners *J. bulbosus* of Linnæus, *squarrosus*, and *bufonius*; and in many plants more remotely allied, such as many of the *Eriophora*, *Schœni* and *Scirpi*. Of the last genus, some of the species produce leaves constantly, as *Scirpus fluitans*, *acicularis*, *setaceus*, &c.: others sparingly, as *cæspitosus*; and others none at all, as *palustris* and *multicaulis*. But the manner in which the leaves are developed in *Juncus trifidus* and *filiformis*, shows in a satisfactory manner that the scales and the awns at the bottom of the stem of *J. glaucus*, and the other leafless species, are of the same nature as those in the plants just named. The scales, which are first produced at the base of the stem of *J. trifidus*, are awnless. As the plant advances the new scales become awned, and afterwards the awns of the following scales are successively enlarged, until at last a complete leaf is developed. The *J. filiformis* produces awns of the same peculiar nature; but they are seldom elongated into leaves. A similar structure is present in some of the *Scirpi*. The *Nardus stricta*, and many others of the Grasses, show at first, in the development of their leaves, the same unsuccessful attempts.

Linnæus and his successors have described the panicle of *J. acutus* and *maritimus* as terminal, accompanied by a two-leaved, spinous, involucre; while they have called the panicle of *J. glaucus*, *effusus*, *conglomeratus*, and *filiformis*, lateral. This involves their

descrip-

descriptions in needless obscurity; and especially since no difference of organization is apparent among any of these species. Why the panicle of *J. maritimus* should be described as terminal, and that of *conglomeratus* as lateral, is irreconcileable with any theory of inflorescence which the Linnean terms countenance. If the elongation beyond the panicle be an involucral leaf in the one, it ought to hold good in the whole of the leafless subdivision. The more consistent and more natural method seems to be, to describe the panicle as lateral, where a similar structure of the stem is continued above the panicle as exists below it; and to denominate the spinous support at the base a bracte. Its analogy to a similar production in *J. bulbosus*, Linn., *squarrosus*, *trifidus*, and many of the *Scirpi* and *Eriophora*, where the support is indisputably called a bracte, justifies the opinion. The membranous scales at the base of the flowers are for convenience called flower-scales.

Specimens of the plants* here described accompany this Memoir.

JUNCUS.

Rush.

Cal. hexaphyllus. *Cor.* nulla. *Caps.* supera, trivalvis, trilocularis: loculamenta polysperma.

* *Culmo nudo.*

1. Juncus acutus.

Juncus culmo nudo pungente, paniculâ laterali, bracteâ spinosâ, capsulis mucronatis subrotundis calyce duplo longioribus.

J. culmo nudo, panicula terminali, involucro diphyllo spinoso, capsula subrotunda acuta, petalis duplo longiore. *Rostkov Monograph.* 14.

* These are deposited in the Museum of the Linnean Society.

J. culmo

J. culmo nudo tereti, paniculâ terminali, involucro diphyllo spinoso, capsulis subrotundis mucronatis. *Fl. Brit.* 374. *Engl. Bot.* xxiii. 1614.

J. *maritimus*, culmo nudo apice bivalvi, paniculâ terminali subumbellatâ, capsula calyce duplo longiore. *Lamarck Encycl.* iii. *p.* 253. *Flor. Fran.* iii. 162.

J. culmo subnudo tereti mucronato, paniculâ terminali, involucro diphyllo spinoso. *Sp. Pl.* 463. *Huds.* 148. *With.* 346.

J. pungens, sive acutus capitulis Sorghi. *Bauh. Hist.* ii. 520. *Moris. s.* viii. *t.* 10. *f.* 15.

J. maritimus capitulis Sorghi. *Park.* 1193. 4.

J. acutus capitulis Sorghi. *Bauh. Pin.* 11. *Raii Syn.* 431.

Angl. Acute Rush. Sea Rush, Great sharp Sea Rush, Pricking large Sea Rush.

In arenosis maritimis, præcipuè cumulis, rariùs.

Peren. July.

Root fibrous, running deep into the sand. *Stem* three feet high, erect, straight, simple, leafless, cylindrical, even, terminating in a very sharp and rigid point. *Leaves* like the stem, but smaller and shorter. *Panicle* lateral, compound, many-flowered, first branch the longest. *Bracte* membranous, and dilated at the base, very pungent. *Flowers* clustered. *Calyx-leaflets* ovate, obtuse. *Capsule* broad-oval, somewhat three-sided, mucronate, shining, three-celled; each cell many-seeded. *Seeds* ovate, attached to the dissepiment, shining: *Coruncle* elongated at each end.

This plant and the following, though separated by the old botanists, have been considered as the same species by Linnæus and many of his disciples. The character first applied by Lamarck—*capsula calyce duplo longiore*—is excellent; and by observing

serving this, and the large, shining, roundish capsule and blunt calyx, the botanist will be at no loss to distinguish the species.

Sir James E. Smith, *Eng. Bot. l. c.*, conjectures that Homer, in his Battle of the Frogs and Mice, had this Rush in view as the weapon with which to arm his imaginary champions. It is not so common in England as the next species, and is not found in any country further to the North. It is one of those useful plants, which Providence has ordained to bind the loose sands of the shore together as a barrier to the ocean.

2. Juncus maritimus.

Juncus culmo nudo pungente, paniculâ laterali subproliferâ, bracteâ spinosâ, capsulâ oblongâ acutâ longitudine calycis.

J. culmo nudo, panicula terminali prolifera, involucro diphyllo spinoso, capsula oblonga acuta petalis æquali. *Rost. Monograph.* 16.

J. culmo nudo tereti, paniculâ terminali proliferâ, involucro diphyllo spinoso erecto, capsulis oblongis. *Flor. Brit.* 375. *Eng. Bot.* xxiv. 1725.

J. *acutus*, culmo nudo mucronato pungente, panicula involucrata laterali, capsula longitudine calycis. *Lamarck Encycl.* iii. *p.* 253. *Flor. Fran.* iii. 163.

J. *acutus* β. *Sp. Pl.* 464. *Huds.* 148. *With.* 346. *Willd. Sp. Pl.* 205.

J. acutus maritimus Anglicus. *Park.* 1193. 7. *Moris. s.* viii. *t.* 10. *f.* 14. *Raii Syn.* 431.

Angl. Sea Rush. Lesser Sharp Sea Rush. English Sea Hard Rush.

In paludibus maritimis copiosè, præcedentis socius.

Peren. August.

Root fibrous, thick. *Stem* two feet or more high, leafless, erect, glaucous,

glaucous, rigid, tapering to a stiff point; sheaths at the base brown, polished, even. *Panicle* erect, decompound, as if proliferous, shorter than the stem; branches very unequal, the first much longer than the rest. *Bracte* membranous at the base, spinous, subulate. *Flower-scales* lanceolate, acuminate. *Calyx-leaflets* lanceolate, acute, zagged towards the point. *Capsule* linear-oblong, triangular, three-celled, light brown. *Seeds* ovate; coruncle elongated at each end.

The J. *maritimus* is a slenderer, lower plant, with an oblong and smaller capsule than the last. The panicle is also much more branched, the first branch far overtopping the others, and the calyx-leaflets lanceolate and acute. The two species cannot be mistaken if seen together when ripe. It is common on most parts of the coast; and, like the last, prevents the sea from making incursions on the land. The flower-scales in this species, and in most of the others, are very much disposed to become foliaceous.

3. Juncus glaucus.

Juncus aphyllus, paniculâ laterali erectâ angustâ, capsulis ellipticis acutiusculis calyce brevioribus.

J. culmo nudo glauco apice inflexo tereti, panicula laterali erecta, capsulis oblongis acutis. *Rost. Monograph.* 9.

J. culmo nudo glauco apice inflexo, panicula laterali effusa, ramis elongatis, floribus acuminatis, *Willd. Sp. Pl.* ii. 206.

J. culmo nudo stricto glauco, panicula laterali erecta, capsulis ellipticis acutis. *Eng. Bot.* x. 665. *Flor. Brit.* 375.

J. culmo striato glauco, basi stipulis fuscis, panicula laterali sparsa. *Sibth. Fl. Ox.* 113.

J. effusus β. *Huds.* 149.

J. inflexus. *Leers* 88. *t.* xiii.. *f.* 3. (*char. spec. dub.*) *Relh.* 141. *With.* 345. *Abbot*, 78. *Huds. Fl. Angl.* 1*st ed.* 130.

J. acutus

J. acutus vulgaris. *Park.* 1193. 1. *Moris. s.* viii. *t.* 10. *f.* 13.
J. acutus. *Ger. Em.* 35. *Raii Syn.* 432.

Angl. Hard Rush. Common Hard Rush. Sharp Rush.

Peren. July, August.

Root creeping, black. *Stem* from one to two feet high, striated, glaucous, rigid, terminating in a sharp, tapering, frequently incurved summit; sheathed at the base with large, brown, shining scales. *Panicle* lateral, bursting about one-third the length of the stem below the top, erect, loose, branched. *Calyx-leaflets* striated, very acuminate; three inner leaflets shorter. *Flowers* hexandrous. *Capsule* elliptical, three-sided, narrower towards the top, mucronate, shining.

However easily distinguished this plant may be on examination, it is uncertain whether it was known to Linnæus, although a production of Sweden, or he has included it in his *J. inflexus*, which no botanist since his time has understood. Willdenow has suffered the latter species to remain in his edition of the *Species Plantarum*, and adds from his own observation this remark: "Culmi suprema pars non est teres, sed folii ad instar compressus*." Sibthorp, who seems to have taken the *J. glaucus* up from Ehrhart (*Gram.* 85.), first introduced the trivial name into the *British Flora*. It may be known even at a distance from the *soft Rushes*, by its rigid stem, of a glaucous hue, and scanty panicle; and, on a closer view, by its pointed capsule. Wahlenburg (*Flor. Lapp. p.* 79.) says of those specimens he found in Lapland, that the flowers were larger than those figured in *English Botany*.

* The authors of the *Flore Française*, vol. v. have expressed their opinion that the *J. inflexus* of their third volume is nothing more than *J. glaucus*; adding at the same time, that the real *J. inflexus*, Linn. has but three stamina.

4. Juncus conglomeratus.

Juncus aphyllus, paniculâ laterali conglobatâ, floribus triandris, capsulis retusis.

J. culmo nudo stricto, paniculâ laterali conglobatâ, capsulis retusis, floribus triandris. *Flor. Brit.* 376. *Eng. Bot.* xii. 835. *Rost. Monograph.* 7.

J. culmo nudo stricto, panicula laterali coarctato-capitata. *Willd. Sp. Pl.* ii. 205.

J. culmo nudo stricto, capitulo laterali. *Sp. Pl.* 464. *Flor. Dan.* 1094. *Leers* 87. *t.* xii. *f.* 1. *Huds.* 148. *Relh.* 140. *Sibth.* 113.

J. lævis vulgaris panicula compactiore. *Raii Syn.* 432.

J. lævis panicula non sparsa. *Bauh. Pin.* 12. *Moris. s.* viii. *t.* 10. *f.* 7.

Angl. Round-headed Rush. Clustered Rush. Conglomerated Rush. Common Rush. Soft Rush.

In pascuis et ad vias, locis humidioribus.

Peren. July, August.

Root horizontal, creeping, fibrous. *Stem* two feet high, sheathed at the base with large black scales, minutely striated, very acute, but not pungent. *Panicle* lateral, many-flowered, densely conglomerate. *Calyx-leaflets* lanceolate, two-nerved. *Stamens* three. *Stigma* very much fringed. *Capsule* obovate, retuse, almost three-lobed, about as long as the calyx.

The dense panicle distinguishes this species at once from its congeners. It is used in common with *J. effusus* to make the wicks of rush-lights, pith in toys, mats, little baskets, chair-bottoms, ropes and lines. Mr. White in his *Natural History of Selborne*, (Letter 26.) has given a pleasing account of its uses to the thrifty housewives of Hampshire. Rushes are employed by the

the cleanly peasantry to strew their floors; and Shakespeare, whose observation was alive to the most insignificant incidents, has many allusions to this custom.

5. Juncus effusus.

Juncus aphyllus, paniculâ laterali effusâ supradecompositâ, capsulis turbinatis apice subtruncatis.

J. culmo nudo stricto, panicula laterali supradecomposita effusa, capsulis clavatis apice truncatis. *Rost. Monograph.* 10.

J. culmo nudo stricto, paniculâ laterali effusâ, floribus oblongis. *Willd. Sp. Pl.* ii. 205.

J. culmo nudo stricto, paniculâ laterali effusâ supradecompositâ, capsulis obtusis. *Flor. Brit.* 376. *Eng. Bot.* xii. 836.

J. culmo nudo stricto, paniculâ laterali. *Sp. Pl.* 464. *Flor. Dan.* 1096. *Leers* 88. *t.* xiii. *f.* 2. *Huds.* 148. *Relh.* 141. *Sibth.* 113.

J. lævis vulgaris, paniculâ sparsâ, nostras. *Raii Syn.* 432.

J. lævis vulgaris, paniculâ sparsâ, major. *Park.* 1191. 2. *Moris. s.* viii. *t.* 10. *f.* 4.

J. lævis. *Ger. Em.* 35.

Angl. Soft Rush. Common Soft Rush. Common Rush. Seaves.

In pascuis humidis, copiosè.

Peren. July, August.

Root creeping, black. *Stem* two feet or more high, pale-green, soft, pliable, very finely striated. *Panicle* effuse, divaricate, very much branched, with numerous flowers. *Calyx-leaflets* subulato-lanceolate, acuminate, two-nerved. *Flowers* frequently triandrous. *Capsule* small, obovate, slightly retuse, nearly truncate, pale brown, with no persistent style.

This

This plant is better adapted than the last for use in all the little arts of weaving and platting:—

"Viminibus mollique detexere junco."

It is cultivated in Japan for the purpose of making mats of an extremely delicate texture, which are used in the place of carpets. Both this and *conglomeratus* indicate a better soil where they grow than *glaucus*. From the latter it is easily separated by the absence of the glaucous hue about the stems, and the obtuse capsule: and its effuse and decompound panicle at once distinguishes it from *J. conglomeratus*. There are intermediate appearances when young, between *effusus* and *conglomeratus*, which are most easily disposed of by observing the distance the panicle breaks forth from the summit; the former having frequently one-third of the stem above the panicle, while the latter has not more than three or four inches. When further advanced, the shape of the capsule is a sure criterion. The *J. lævis alter* of *Moris. s.* viii. 231. 5. is probably nothing more than this "brevior et crassior."

6. Juncus filiformis.

Juncus aphyllus, culmo filiformi nutante, paniculâ laterali subsimplici pauciflorâ, capsulis subrotundis.

J. culmo nudo filiformi nutante, umbella laterali subsimplici pauciflora, pedunculis subbifloris, capsulis obtusis. *Rost. Monograph.* 12.

J. culmo nudo filiformi nutante, paniculâ laterali bracteatâ subsimplici, capsulis subrotundis. *Flor. Brit.* 377. *Eng. Bot.* xvii. 1175.

J. culmo filiformi nudo, paniculâ brevissimâ pauciflorâ laterali. *Lamarck Encycl.* iii. 254.

J. culmo

J. culmo nudo filiformi nutante, paniculâ laterali. *Sp. Pl.* 465. *Leers* 89. *t.* xiii. *f.* 4. *Huds.* 149. *Smith Spicileg. t.* 3.

J. parvus, calamo supra paniculam compactam longius producto. *Raii Syn.* 432.

Angl. Least Rush. Thread-form Rush.

In irriguis alpinis, inque Anglia præcipuè ad ripas lacuum borealium.

Peren. July, August.

Root creeping, horizontal, fibrous. *Stem* soft, generally a few, rarely ten inches high, very slender, tapering towards the summit, frequently drooping, sheathed at the base with scales, which are light-brown, obtuse, remarkably awned. *Panicle* from three- to eight-flowered, nearly simple, remarkable for bursting from about the middle of the stem. *Flowers* sessile, supported by a small bracte. *Fruit* peduncled. *Calyx-leaflets* lanceolate, acute, very nearly equal; keel three-nerved. *Capsule* globose, about the length of the calyx.

This plant has never been found in England, excepting on the margin of the lakes in the North, being a similar situation to that in which it is found on the Continent. Pursh states it to be frequent in boggy mountain-meadows in North America. Its diminutive size, and long slender summit above the panicle, sufficiently mark its character; though in habit it approaches very nearly to the two last described. Indeed, I anticipated a closer resemblance when I found three stamens to be common to both the other soft Rushes *conglomeratus* and *effusus*; and I examined numerous fresh specimens of *filiformis*, with the view to discover the same numerical structure, but could never observe it. The small awn at the point of the radical sheaths appears to be an attempt towards the

the production of leaves; a circumstance which is seen more completely developed in *J. trifidus*. The English name, by which it is generally known, is objectionable on account of its having been applied by the old botanists to *Scirpus setaceus*; but it is better to retain the commonly-received name, if it is at all tolerable, than to introduce a new one.

** *Folia canaliculata.*

7. Juncus squarrosus.

Juncus culmo nudo, foliis setaceis canaliculatis, paniculâ terminali elongatâ, capsulis obovatis.

J. culmo nudo, panicula terminali elongata, capsulis obtusis, foliis setaceis canaliculatis. *Rost. Monograph.* 17.

J. culmo nudo, foliis setaceis, paniculâ terminali compositâ glomeratâ. *Flor. Brit.* 378. *Eng. Bot.* xiii. 933.

J. culmo nudo, foliis setaceis, capitulis glomeratis aphyllis. *Sp. Pl.* 465. *Flor. Dan. t.* 430. *Huds.* 149. *Relh.* 142. *Sibth.* 114.

J. montanus palustris. *Raii Syn.* 432.

Gramen junceum palustre humilius, folia et spica Junci. *Moris. s.* viii. *t.* 9. *f.* 13.

J. acutus Cambro-britanicus. *Park.* 1193. 2.

Angl. Moss Rush. Heath Rush. Welsh Rush. Ragged Rush. Goose Corn.

In montosis et ericetis sterilibus, præcipue solo spongioso, copiosè.

Peren. June, July.

Root fibrous. *Stem* a foot or more high, straight, rigid, striated, leafless. *Leaves* in tufts, setaceous, channelled, rigid, pointed, smooth, dilated and sheathing at the base, not half so long as the

the stem. *Panicle* terminal, erect, branched, clustered. *Bractes* membranous, sheathing, brown, striated, terminating in a stiff sëtaceous point. *Calyx-leaflets* chocolate-coloured, scariose at the edge. *Capsules* obovate, shining, obscurely three-sided, obtuse, mucronate.

This plant fully justifies the proverbial worthlessness of the Rush. It indicates a most unprofitable soil, and is well known from the harshness of its herbage. Lime is recommended by agriculturists as the means of destroying it. What relation it has to Geese in Ray's English name I know not; excepting, indeed, that they may frequent some places where it grows. The figures in *Ger.* 18. 4. *Gramen junceum maritimum*, which Ray quotes with a doubt, and in *Ger. em.* 21. 4., copied by Parkinson, p. 1270., although referred to this plant by modern authors, cannot be cited with any certainty, since they have the male spikes of a Carex delineated at the top, and the capsules bear little resemblance. The leaves and root, indeed, are faithfully represented. This species has but little affinity with any other; and, when once known, is not likely to be mistaken.

8. Juncus compressus.

Juncus culmo simplici folioso compresso, foliis linearibus margine incurvis, capsulis rotundis calyce longioribus, paniculâ terminali bracteâ breviore.

J. foliis linearibus canaliculato-concavis, capsulis ovatis, culmo compresso. *Jacq. Vindb.* 235.

J. *bulbosus*, culmo folioso simplici compressiusculo, foliis canaliculatis, corymbo terminali foliis floralibus breviore, capsula subrotunda obtusa petalis longiore. *Rost. Monograph.* 23.

J. *bulbosus*, culmo compresso indiviso, foliis linearibus canaliculatis, corymbo terminali, calycinis foliolis obtusis, capsula subrotunda obtusa brevioribus. *Willd.* ii. 213.

J. *bulbosus*, foliis linearibus canaliculatis, culmo basi folioso, paniculâ cymosâ, capsulis obtusis. *Flor. Brit.* 381. *Eng. Bot.* xiii. 934.

J. *bulbosus*, foliis linearibus canaliculatis, capsulis obtusis. *Sp. Pl.* 466. *Huds.* 150. *Relh.* 143. *Sibth.* 115. *Abbot*, 79. *Leers Fl. Herb.* 89. *t.* xiii. *f.* 7.

J. parvus cum pericarpiis rotundis. *Raii Syn.* 433.

Gramen juncoides junci sparsa panicula. *Park.* 1190. 7.?

Gramen junceum aquaticum. *Ger.* 11. 2. *Ger. Em.* 12. 2. *Park.* 1269. 3.

Angl. Round-fruited Rush. Rushie Water Grass.

Habitat in pascuis humidis.

Peren. July, August.

Root creeping, horizontal, fibrous, not bulbous. *Stem* erect, from six to twelve inches high, simple, cylindrical at the base, compressed upwards, smooth, leafy, particularly at the base. *Leaves* linear, channelled, dilated and involute at the base, striated. *Panicle* inclining to a corymb, compound, many-flowered, the first branch longer than the others. *Bractes* foliaceous, channelled; the lowermost longer than the panicle. *Calyx-leaflets* obtuse, brown, scariose at the edge, shorter than the capsule. *Capsule* rotund, very obtuse, mucronate.

I have ventured to separate Linnæus's *Juncus bulbosus* into two species, and to abolish the trivial name altogether, in consequence of the confusion of synonyms that it has occasioned, and its total want of appropriateness. The plant bearing this name in the first edition of the *Species Plantarum*, is the *uliginosus* of Smith and of the present paper (which has a bulbous root), as appears from the remarks of Ehrhart; and the transfer of it in the succeeding editions to the present plant, seems to have originated in an oversight of the illustrious Swede. The name given by Jacquin is

very

very significant; for which reason I have adopted it. I think there can be little doubt of the figures which I have quoted belonging to this species, though that in *Eng. Bot.* has the capsule badly represented, and more like *J. bottnicus* of Wahlenburg. *J. compressus* is to be distinguished from *J. cœnosus*, the next species, by its lighter colour, broader and more concave leaves, the capsule being longer than the calyx, and the lower bracte longer than the panicle. The leafy stem and blunt calyx-leaflets are sufficient marks to separate it from the rest of this subdivision. It is generally an inland plant; whereas *cœnosus* is confined to the shore. The authors of the *Flore Française* seem to have observed the difference of the two plants, and have, I conceive, described the seashore species under their *bulbosus*, and the inland one under *J. Gerardi*, *v.* 5. *p.* 308.

9. Juncus cœnosus.

Juncus culmo simplici folioso, foliis setaceis canaliculatis, capsulis obovatis obtusis longitudine calycis, paniculâ terminali subsimplici bracteâ longiore.

Angl. Mud Rush.

Habitat in salsis copiosè.

Peren. July, August.

Root creeping, fibrous. *Stem* from two inches to a foot high, erect, leafy, simple, smooth. *Leaves* setaceous, channelled, slightly striated. *Panicle* inclined to a corymb, terminal, erect, few-flowered, longer than the bracte. *Bracte* at the base of the panicle setaceous. *Calyx-leaflets* obtuse, dark chocolate-coloured, as long as the capsule; three inner leaflets scariose at the margin. *Capsules* somewhat unilateral, obovate, very obtuse.

I rely principally on the shape of the capsule, the proportion it bears to the calyx, the more rigid nature of the stem and leaves, the length of the bracte, and the altogether darker colour of the

plant, as marks to distinguish this from the preceding species. It is very plentiful in those places on the coast subject to be overflowed by the sea, and varies very much in size. Virgil's epithet, "limosus juncus," applies to most of this family, but to none more forcibly than this. The *Flor. Dan.* figure 431, and Morison's *sect.* viii. *t.* 9. *f.* 11. resemble this more than the last. The names of *Lob.* 18., *Ger.* 18. 1., *Ger. em.* 21. 4., and *Park.* 1270. 6., correspond much better with *J. cœnosus* than with *J. squarrosus*; and indeed Ray, in the first edition of his *Synopsis*, so applied them; but was afterwards induced to change his opinion by the observations of Dr. Plukenet (vid. *Philosophical Letters* of Ray, p. 232.), who says, "I must needs acknowledge that I am not a little entangled in my thoughts about the *Juncus parvus cum pericarpiis rotundis*, J. B., which though you are pleased to make the same with the *Gram. junc. marit.* Lob., I cannot easily obtain with myself a compliance herein, but do rather accept it as the *Juncus acutus Cambro-britannic.* Park., and which I take to be a true and genuine Rush, as you most truly have observed. But unto this you are pleased to apply the *Junc. Cambro-brit.*, Park. (*h. e.*), *Gr. junc. maritim.*, Lob., whose *Icon* of it (and indeed so do those of all other authors) agrees exactly with our *Moss-Rush*, the capsules whereof are somewhat elongated and pinched in towards the top, resembling more a cone than a globe, the capsules of the former being more accurately round, according as its name imports." Ray, however, in his second edition of the *Synopsis*, states, that though he agrees with Dr. P. in rejecting the synonyms of Bauhin, which he had before quoted, he could not assent to this being the *Juncus acutus alpinus Cambro-britanicus*, Park. It induced him, nevertheless, to omit this synonym under *J. squarrosus*, to which, in the first edition, he had appropriated it—a change which I cannot but think was erroneous. If the distinction of the two plants *J. compressus* and *cœnosus* be admitted, the

the difficulty, perhaps, may be explained; since the synonyms of Bauhin are all applicable to the latter species, and the figures of Gerard, C. Bauhin, Parkinson, and Johnson are not to be depended on, seeing that they represent the male spike of a *Carex* terminating the panicle, and that Gerard's is the only original figure among them, the rest being merely copied from him. Vaillant (*Botan. Paris.* 109, 110.) has arranged the synonyms of the old authors, as far as relates to *J. squarrosus* and *bulbosus* Linn. in a more satisfactory manner than any person I have consulted.

10. Juncus bufonius.

Juncus culmo dichotomo, foliis angulatis, floribus solitariis sessilibus, calycibus setaceis capsulâ duplo longioribus. *Wahlenburg. Flor. Lap.* 81.

J. culmo folioso subramoso, foliis linearibus canaliculatis paniculâ dichotoma, ramis multifloris, petalis acuminatis capsula obtusa longioribus. *Rost. Monograph.* 20.

J. culmo dichotomo, foliis angulosis, floribus solitariis sessilibus. *Sp. Pl.* 466. *Flor. Dan.* 7. *t.* 1098. *Leers* 90. xiii. 8. *Huds.* 150. *Relh.* 144. *Sibth.* 115. *With.* 348.

J. foliis linearibus canaliculatis, culmo dichotomo racemoso, floribus solitariis. *Flor. Brit.* 381. *Eng. Bot.* xii. 802.

J. palustris humilior erectus. *Raii Syn.* 434.

Gramen junceum vulgare capitulis paleaceis. *Moris. s.* viii. *t.* 9. *f.* 14.

Gramen junceum parvum sive Holostium Matthioli. *Park.* 1190.

Gramen junceum. *Ger.* 4. *Ger. em.* 4.

β. Gramen juncoides minimum Anglo-britannicum, Holosteo Matthioli congener, aut Bufonis Gramini Flandrico. *Raii Syn.* 434.

Gramen junceum minimum, Holosteo Matthioli congener. *Park.* 1270.

Angl.

Angl. Toad Rush. Toad Grass. Rush Grass.

Habitat in humidis et aquosis.

Ann. June, July, August.

Root fibrous. *Stems* from an inch to a foot high, numerous, dichotomous, upright, cylindrical, smooth, striated, leafy. *Leaves* linear, channelled, acute, dilated at the base, not jointed. *Flowers* solitary, rarely in pairs, sessile, erect, growing in somewhat of a spike on the terminating branches. *Calyx-leaflets* setaceous, acuminate, with the keel green and the remainder scariose. *Bractes* ovate, scariose. *Capsules* elliptical, rather obtuse, shorter by half than the calyx. *Seeds* very numerous.

The solitary flowers and long silky calyx sufficiently mark the character of this species. Like others of its congeners, it is occasionally gemmiparous. It is subject to great variation in size, owing to the soil in which it grows. Sometimes it may be observed on a sandy coast not an inch high, with a capsule not quite obtuse; at other times, in a richer soil, where water has stood during the winter, it may be seen shooting into a long simple culm exceeding a foot in height. The var. β is thus described by Dillenius: "Priori simili (*i. e.* the common one), sed multo minus, et minus ramosum, coloris plerumque rubentis: florendi etiam tempore differt, nam mensis et sesquimensis spatio illud antecedere solet." I could never perceive that it was worth much attention. The old botanists, from whom Linnæus adopted his trivial name, imagined some affinity to exist between this species and the toad, because this animal inhabits similar places. A seedling plant is figured in Rose's *Elements of Botany*, *Appendix*, *t. 2. f. 5. A. and B.*

The *Juncus gracilis*, published in *Eng. Bot.* xxxi. 2174., has an inflorescence and fructification the most like this, but that has broader and emarginate valves to the fruit.

11. Juncus

11. Juncus gracilis.

Juncus foliis linearibus planis, caule dichotomo racemoso foliis altiore, floribus solitariis. *Compend. Flor. Brit.* 56.

Juncus gracilis. *Eng. Bot.* xxxi. 2174.

Angl. Slender Rush. Slender spreading Rush, *E. B. l. c.*

Habitat in paludibus alpinis Scoticis, rariùs.

Peren. July.

"The *Root* consists of woolly fibres, and has the appearance of being perennial. *Stem* very slender, a foot or more in height, naked, except at the base and summit. *Radical leaves* but one or two, much shorter than the stem, narrow, flat, slightly thickened, or somewhat involute, at their edges, not channelled. The top of the *Stem* terminates in a few racemose forked branches, with two or three leaves at the base. *Flowers* solitary, mostly sessile. *Calyx-leaves* sharp-pointed. *Valves* of the *Capsule* blunt and emarginate.

"Found by Mr. G. Don in 1795 or 1796, by the side of a rivulet in marshy ground, among the mountains of Angus-shire, but very rarely. It appears to us to be a nondescript: but we received from Mr. Dickson, some years before the above date, a specimen not so far advanced towards maturity, of what seems to us the same species.

"The inflorescence and fructification of this Rush come nearest to *bufonius*, *t.* 802.; but the fewness of the flowers, taller stem, and flatter leaves, as well as the broader and emarginate valves of the fruit, serve well to distinguish it; not to mention the probably perennial root. *Eng. Bot. l. c.*"

This species is unknown to me, except from the description I have here quoted. I may however add, that it is not the *gracilis* of *Roth Germ.* i. 155. ii. 402., which is *J. capitatus*, Willd.; nor

of

of Brown's *Prod. Flor. Nov. Holl.*; and whose name, therefore, being first applied to another species, ought to take precedence of that in *Eng. Bot.* Plants brought from the Cambridge garden as authentic specimens are, I think, a variety of *J. pygmæus* of the French botanists; but they are so unlike the figure in *English Botany*, that I cannot persuade myself but that there is some mistake.

12. Juncus trifidus.

Juncus culmo nudo, capsulâ oblongâ calycem æquante, bracteis foliaceis canaliculatis floribusque tribus terminalibus.

J. culmo basi nudo, apice triphyllo subtrifloro. *Rost. Monograph.* 54.

J. culmo nudo, foliis floribusque tribus terminalibus. *Sp. Pl.* 465. *Flor. Dan.* 107. *Huds.* 149. *Lightf.* 183. *t.* 9. *f.* 1. *With.* 345. *Flor. Brit.* 378. *Eng. Bot.* xxi. 1482.

J. *monanthos.* *Jacq. Obs.* 33. *t.* 4. *f.* 1.

J. acumine reflexo, minor et trifidus. *Bauh. Prod. t.* 22.

Angl. Three-leaved Rush. Trifid Rush. Three-cleft Rush.

Habitat in paludibus alpinis Scoticis, rariùs.

Peren. July.

Root creeping, fibrous. *Stems* very numerous, from a few inches to a foot in height, filiform; at the base sheathed with numerous awned brown scales, which are terminated abruptly with a membranous and fringed border; awns in the upper scales more or less leafy. *Flowers* from one to three, terminal, accompanied by three foliaceous channelled bractes, two of them near the flower, the third sometimes at a distance, membranous at their base, fringed at their border. *Calyx-leaflets* scarcely so long as the capsule. *Capsule* oblong, large, shining, acuminate; cells few-seeded.

Lightfoot says that he found the Scotch specimens all with a single flower, corresponding with Jacquin's *J. monanthos.* On the

the contrary, Wahlenburg informs us that he never met with the one-flowered variety in Lapland. It is also worthy of remark, that Linnæus's plant does not produce radical leaves; whereas ours possesses them more or less, showing at the same time by the awn, which terminates the scales, many fruitless attempts at perfecting them, though they are more completely produced at every new effort. It is the connecting link between the *Junci* and the *Luzulæ*. "Mira omnino mihi videtur species," says Wahlenburg, *Flor. Lap.* 81, "ad radicem prorsus aphylla. Radix repens culmos multos fasciculatos exserens squamis tantum brevibus interstinctos. Vaginæ culmi basin vestientes brevi mucrone ornatæ, de cætero in fimbrias partitæ. Folium in suprema parte culmi plerumque adest, bracteis simillimum; ligula fimbriata alba. Bracteæ canaliculatæ; marginibus serrulatis. Semina in singula capsula pauca: de cætero quoque structura capsulæ inter Juncum et Luzulam ambigit. Capsula oblonga. *J. monanthos*, *Jacq.* differre mihi videtur: foliis radicalibus; et capsula ovali, duplo majore, calycem excedente."

13. Juncus uliginosus.

Juncus, foliis setaceis canaliculatis, floribus ternis sessilibus, capsulâ obtusâ calycem excedente, culmo bulboso radicante.

J. foliis setaceis subnodoso-articulatis, capitulis trifloris subproliferis, culmo bulboso radicante. *Flor. Brit.* 380. *Eng. Bot.* xii. 801.

J. culmo folioso, floribus fasciculatis, fasciculis proliferis, foliis setaceis articulato-nodosis. *Sibth.* 115.

Gramen junceum minimum, capsulis triangularibus. *Raii Syn.* 434.

Gramen junceum capsulis triangulis minimum. *Moris. s.* viii. *t.* 9. *f.* 3.

β. capitulis foliaceis et gemmiparis. Var. *Raii Syn.* 434. 11.

J. uliginosus. *With.* 348.

Gramen junceum minimum, paniculis foliaceis. *Moris. s.* viii. *t.* 9. *f.* 4.

G. junceum aquaticum paniculis cum foliis capillaribus. *Pluk. Phyt. t.* 32. *f.* 3.

Juncoides calyculis paleaceis, glomeratis folio varians. *Scheuch. Agrost.* 330. *t.* 7. *f.* 30.

γ. culmo longiore, foliis caulinis subnodoso-articulatis, capitulis proliferis.

J. *fluitans*, culmo bulboso tenui radicante, foliis setaceis subnodoso-articulatis, capitulis trifloris subproliferis. *Lamarck Dict.* iii. 270. *Flor. Gal.* 152.

J. uliginosus. *Flor. Dan.* 817.

Angl. Bulbous Rush. Little bulbous Rush. The least triangular-seeded Rush.

Peren. July, August.

Habitat in ericetis humidis arenosis, vel turfosis; γ in stagnis.

Root fibrous. *Stem* bulbous at the base, erect, leafy, slender, branched upwards; branches divaricate. *Leaves* setaceous, smooth, channelled, cellular; cells in a double row, the partitions of one being opposite to the middle of another in the corresponding series; in γ some are articulate. *Flowers* three together, lateral and terminal, sessile. *Bractes* small, scariose, shorter than the flowers, excepting in the viviparous variety as it is improperly called, in which they are lengthened out like the leaves. *Calyx-leaflets* all of the same length, scariose at the edge, chocolate-coloured; keel green. *Capsule* three-sided, obtuse, opake, somewhat longer than the calyx.

This plant has, till lately, been in a very unsettled state, as may be seen by the numerous synonyms quoted by most authors. It is not readily distinguishable in some states from other species; but

but its blunt capsule will enable the botanist to separate it from *J. lampocarpus* and *acutiflorus*; and, besides the diagnostic marks mentioned under *supinus* and *subverticillatus*, the opake chocolate-coloured calyx and capsule are very constant characters. This is Haller's 1320, which he says he received from Dillenius as his *Gramen junceum capsulis triangulis minimum*; so that this clears up all doubt about the synonym; and most probably the *J. supinus* of the *Flore Française* iii. 168. The var. β has its little flower-heads more or less foliaceous and gemmiparous,—a monstrosity to which this and its near affinities are very liable. Wahlenburg, *Fl. Lap.* 82., suspects, erroneously, the figure of it in *Eng. Bot. t.* 801. to be the *acutiflorus* of Ehrhart, and of the present paper. The var. γ, which is not uncommon, is very likely to prove a species.

14. Juncus supinus.

Juncus foliis canaliculatis filiformibus, capitulo trifloro terminali secundo, bracteis setaceis foliaceis.

J. culmo dichotomo, foliis canaliculatis filiformibus, capitulo triphyllo. *Mœnch. Enum. Plant.* 296. *t.* 5. *Fl. Dan.* 1099. *Hoff. Germ.* 125. *Don's Herb. Brit. f.* 4. 85.

J. *capitatus*, foliis setaceis, capitulis terminali alarique subfoliosis, petalis acutis integris pericarpio æqualibus. *Weigel. Obser. Bot. p.* 28. *t.* 2. *f.* 5.

Schœnus minimus, culmo tereti nudo, capitulo dimidiato involucrato, involucris 3—5-phyllis, valvula altera subulata flores superante. *Symon's Synop. Plant.* 197.

J. subverticillatus β. *Willd.* ii. 212.

Angl. Dwarf Rush.

Habitat in uliginosis.

Peren. July.

Root fibrous, bulbous at the base. *Stem* erect, simple, two or three inches high. *Leaves* filiform, channelled, cellular. *Flowers* three

three together, terminal, clustered. *Bractes* setaceous; one or more frequently foliaceous, longer than the flowers, and forcing them on one side. *Calyx-leaflets* lanceolate, chesnut-coloured. *Capsule* oblong, rather obtuse, three-sided, not quite so long as the calyx.

The synonyms I have quoted may I think be depended on. The figure in *Flor. Dan.* 1099. represents the plant stronger than it usually is; and in which case it occasionally produces branches of lateral flowers, but in its more common state they are only terminal. Bauhin, in his *Hist.* ii. 523., has probably described and figured this species under his *Juncus foliatus minimus*. The synonym brought from Symon's *Synopsis* is determined by authentic specimens in the herbarium of my friend Mr. Edward Forster, F.L.S., which formerly belonged to Hudson, and from which the character and description in that little work were drawn up.

Mr. George Don, who has the merit of first pointing out the species as of British growth, makes the following remarks: "I observed this plant, in October 1804, by the side of a rivulet near the summit of Ben Lawers, in a situation where the snow remains the greater part of the year, and not far from the spot where I first discovered the *Juncus castaneus* in May 1794, at which time the first-mentioned place was covered with snow. I have cultivated the plant, and carefully compared my specimens in their different appearances with the figure in *Flora Danica*, which I consider as a just resemblance of this variable plant. The leaves which accompany the flowers, where they become terminal, give the plant the appearance of being viviparous. The plants, which I have cultivated, flowered in July; but in their native place they do not probably show their flowers earlier than August or September." *Don's Herb. Brit. fasc.* v. 85.

This plant, to say the least of it, appears very different from the rest. Its near approach to *uliginosus*, and the strong disposition

there

there is in the bractes of all the species to become foliaceous, induces me to hesitate. The German botanists, however, whose acuteness is not often to be surpassed, continue to admit it as distinct. It is very small, not exceeding generally one or two inches in height. I met with it in boggy ground about Ambleside.

*** *Foliis articulatis.*

15. Juncus triglumis.

Juncus foliis subulatis, floribus ternis terminalibus sessilibus, capsula obtusiuscula longitudine calycis. *Wahlen. Flor. Lap.* 84.

J. culmo basi folioso, foliis linearibus planis, capitulo trifloro involucrum subæquanti. *Rost. Monograph.* 52.

J. foliis planis, gluma triflora terminali. *Sp. Pl.* 467. *Flor. Dan.* 132. *Huds.* 151. *Lightf.* 186. *t.* 9. *f.* 2.

J. floribus terminalibus subternis, bracteis duabus ovatis flores subæquantibus. *Vahl. Act. Soc. Hist. Nat. Haf.* ii. 1. 38.

J. foliis planis, capitulo trifloro terminali erecto aphyllo ebracteato. *Flor. Brit.* 382. *Engl. Bot.* xiii. 899.

J. gluma triflora culmum terminanti. *Flor. Lap.* 115. *t.* 10. *f.* 15.

Juncello accedens graminifolia plantula capitulis Armeriæ proliferæ. *Raii Syn.* 430.

Gramen cyperoides minus Caryophylli proliferi capitulis. *Moris. s.* viii. *t.* 12. *f.* 40.

Angl. Three-flowered Rush. Three-glumed Rush. Small Rush-grass, with heads like a childing Sweet William's.

Habitat in locis uliginosis et irrigatis, rariùs.

Peren. July, August.

Root fibrous. *Stems* four to six inches high, erect, straight, cylindrical, leafy only at the base. *Leaves* subulate, compressed, sheathing, somewhat jointed; cells like those of *J. uliginosus*. *Flowers* terminal, erect, nearly sessile, generally three together. *Bractes* oval, concave, nerved, bright brown, membranous; two outer

outer ones largest, not longer than the flowers, and opening so as to let them stand all on the same plane. *Calyx-leaflets* lanceolate, equal, blush-coloured at the tips. *Style* very short. *Capsule* elliptical, mucronate, somewhat obtuse, three-sided, scarcely exceeding the calyx. *Coruncula* elongated at each end of the seed.

This is not so rare a plant with us as the *J. biglumis*, being found in the mountainous districts of Wales and of the North of England, as well as in Scotland. I have met with it on Helvellyn, on Fairfield, and most of the other mountains about Ambleside, and at the edge of Scales Tarn in Saddleback. Dillenius mistook it for a variety of *Scirpus cæspitosus*. The leaves instead of being flat, as described in the specific character by every botanical author but Haller, Wahlenburg, and Brown, are constructed with cells in a similar manner to those of *J. uliginosus*; and the articulations are much more susceptible to the touch on drawing a leaf between the thumb and finger—"Semper tam angusta et teretiuscula reperi, ut jure meritoque subulata dici possunt." *Flor. Lap. Wahlen.* 84.

16. Juncus biglumis.

Juncus foliis subulatis, floribus binis terminalibus altero pedicellato, capsulis apice retusis calyce longioribus. *Wahlen. Flor. Lap.* 84.

J. culmo basi folioso, foliis linearibus planis, capitulo subbifloro folio suffulto. *Rost. Monograph.* 53.

J. foliis subulatis, gluma biflora terminali. *Sp. Pl.* 467. *Flor. Dan.* 120. *Huds.* 649. *Lightf.* 1100.

J. floribus terminalibus subgeminis, bractea altera floribus longiore acuminata. *Vahl. Act. Soc. Hist. Nat. Haf.* ii. 1. 38.

J. foliis planis, capitulo bifloro terminali secundo basi foliato. *Flor. Brit.* 382. *Eng. Bot.* xiii. 898.

Angl. Two-flowered Rush. Two-glumed Rush.

Habitat

Habitat in locis irriguis summarum alpium, rarissimè.
Peren. August.
Root fibrous. *Stem* three or more inches high, leafy, simple, striated. *Leaves* compressed, jointed, erect, sheathing, pointed. *Flowers* terminal, binate, unilateral, one above the other; upper one on a short footstalk. *Bractes* two; larger one foliaceous, erect, forcing the fruit on one side. *Calyx-leaflets* lanceolate, pointed, equal, keeled, chocolate-coloured. *Stamens* longer than the calyx. *Capsule* large, turbinate, retuse, chocolate-coloured above, longer than the calyx. *Seeds* numerous; appendage elongated at each end.

This rare plant has been found with us only in Scotland, particularly on Ben Lawers in Breadalbane. The old botanists were unacquainted with it; and even Lightfoot suspected it might be a variety of *J. triglumis*. The two species are, however, perfectly distinct, and may be recognised at once by observing that one of the bractes in *J. biglumis* is much longer than the flowers, and the capsule turbinate. The seeds are remarkably distinguished by their covering.

17. Juncus castaneus.

Juncus foliis planis amplexicaulibus, capitulo terminali subgemino multifloro basi foliato, bracteis acutis. *Flor. Brit.* 383. *Rost. Monograph.* 49. *Eng. Bot.* xiii. 900.
J. *Jacquini*, folio subulato, capitulo terminali subquadrifloro. *Sym. Syn.* 87. *Hull.* 76.
Habitat in alpibus Scotiæ, solo micaceo udo.
Peren. July.
Root creeping, with runners. *Stem* erect, straight, from six to twelve inches high, cylindrical, solitary, leafy. *Leaves* principally on the stem, alternate, erect, compressed, jointed above; sheathing, folded and dilated at the base so as to make a sharp keel. *Heads* terminal, erect, one above the other, from three to

to eight-flowered, shining, nearly black. *Bractes* membranous, linear-lanceolate, acuminate. *Calyx-leaflets* lanceolate; outer ones longer and more acute than the inner. *Stamens* the length of the calyx. *Style* persistent, of about the same length as the stigmas. *Capsule* oblong, pointed, three-celled, black, longer than the calyx. *Seeds* numerous in each cell; appendage subulate at each end.

The first botanist of whom we have heard who took notice of this new species, was Dr. Steuart. He gathered it on Ben Challum. Mr. Dickson brought it from Ben Lawers; and it was published first under the name of *J. Jacquini* in Symon's *Synopsis Plantarum Insulis Britannicis Indigenarum, &c.* Others have mistaken it, in the same way; and I am afraid that the draughtsman of the figures in *English Botany* has fallen into the error. *J. Jacquini* has the lower bracte with a long filiform summit, very acuminate calyx-leaflets, very short stamens, and one leaf on the stem. It belongs to that division of the genus which has channelled leaves; while *J. castaneus* is an articulate-leaved species. In addition to the habitats before mentioned, I have it gathered by Mr. Borrer, in Fion Glen in Breadalbane.

18. Juncus subverticillatus.

Juncus foliis caulinis subulatis nodoso-articulatis, paniculâ corymbosâ, capitulis subquinquefloris fasciculato-verticillatis, capsulâ obtusâ calycem striatum æquante.

J. culmo procumbente, foliis setaceis subarticulatis, corymbo dichotomo divaricato, capitulis subquinquefloris sessilibus. *Rost. Monograph.* 42.

J. culmo decumbente, foliis setaceis, floribus glomeratis verticillatis, glomeratis foliosis. *Willd.* ii. 212.

Gramen junceum sylvarum minus articulato folio. *Park.* 1189. 6.

Angl. Whorled Rush.

Peren. July, August. *Stem*

Stem a little bulbous at the base, decumbent, striking root at the joints, generally a few inches in height, cylindrical, fistulous. *Leaves* at the root filiform, articulate; those of the stem larger, subulate, knotty-jointed, brittle, springing from a large scariose sheath. *Flowers* in a corymb, as if proliferous, fasciculato-verticillate, light-brown. *Calyx-leaflets* lanceolate, acuminate, striated, rigid. *Capsule* obtuse, light-brown, not longer than the calyx, somewhat shining, mucronate.

Though I am not enabled to ascertain many modern synonyms with certainty for this common plant, I feel confident that it will be found on examination to be a good species. The French botanists give it the above name in their herbaria. Rostkov, Willdenow, and most others seem to have considered the *J. uliginosus* of Smith and this to be the same. Sibthorp's description of *uliginosus* corresponds so nearly with it, that I think he had an eye to it in drawing up his specific character—"Floribus fasciculatis, fasciculis proliferis, foliis setaceis articulato-nodosis." Withering's definition is also applicable to this. Haller's no. 1321 is most likely intended for it—"Foliis sessilibus articulatis, paniculâ simplici, glumis aristatis." And Parkinson's figure 1189 tolerably corresponds.

19. Juncus acutiflorus.

Juncus foliis nodoso-articulatis, paniculâ terminali supradecompositâ, calycis foliolis omnibus lanceolatis acuminatis capsulam acuminatam æquantibus.

J. foliis compressiusculis panicula terminali supradecomposita diffusa, calycis foliolis omnibus lanceolatis acuminatis, capsula ovato-oblonga triquetra mucronata, culmo 3—4-folio. *Davies, Linn. Trans.* x. 13.

J. foliis nodoso-articulatis subcompressis, culmo enodi paniculâ decompositâ dichotomâ, calyce omninò acuto. *Compend. Flor. Brit.* 55. *Eng. Bot. t.* 238. *descrip.* 2143.

J. *sylvaticus*, culmo erecto, foliis nodoso-articulatis teretibus, panicula composita, foliolis calycinis aristatis interioribus longioribus. *Willd.* ii. 211.

J. *nemorosus*, culmo folioso erecto, foliis subteretibus, nodoso-articulatis, panicula supradecomposita. *Sibth.* 114.

J. *articulatus*, foliis nodoso-articulatis, capitulis paniculatis multifloris. *Relh.* 138.

J. foliis nodoso-articulatis, floribus acutis. *Ehrh. Gram.* 66.

J. foliis teretibus articulatis, panicula repetito-ramosa. *Hall. Hist.* 1323.

J. nemorosus folio articuloso. *Raii Syn.* 433.

Gramen junceum articulatum palustre erectum et elatius. *Moris. s.* viii. *t.* 9. *f.* 2.

Gramen junceum sylvaticum sparsa panicula. *Park.* 1189. 5.

Gramen junceum aquaticum magis sparsa panicula. *Park.* 1269. 4.

Gramen junceum sylvaticum. *Ger. Em. fig.* 22?

Angl. Sharp-flowered Rush. Sharp-flowered jointed Rush. Greater jointed Rush. Wood Rushie Grass.

Habitat in sylvis humidis et aquosis.

Peren. June, July.

Root fibrous, creeping. *Stems* two or three feet high, slender, erect, compressed, smooth; joints fistulous. *Leaves* three or four on a stem, sheathing, compressed, smooth, knotty-jointed. *Panicle* terminal, very much divided, diffuse; branches long, slender, smooth. *Calyx-leaflets* all acuminate and of a similar consistence. *Capsule* three-sided, ovate-oblong, acuminate, light brown, a little shining, about the length of the calyx.

This

This is unquestionably a good species, and the Rev. Hugh Davies's remarks leave me nothing to add to the diagnostic description. "The panicle of this is more branched than that of the last, the branches more slender and spreading, the divisions of the calyx narrower and longer, the capsule smaller, much more taper-pointed and lighter-coloured; culm of fewer joints, that and the leaves less compressed. It is a taller plant, sometimes above three feet high, and it ripens later." I cannot persuade myself that Ray did not intend this species and not *obtusiflorus* by his *J. nemorosus folio articuloso*; since in his *Hist. Plant.* he quotes *Ger.* 20. 10. (a most excellent representation of the *obtusiflorus*) with a doubt.

20. Juncus lampocarpus.

Juncus foliis compressis, paniculâ terminali compositâ erectâ, calycis foliolis tribus interioribus obtusiusculis, capsulâ acutâ triquetrâ nitidissimâ.

J. foliis nodoso-articulatis compressis, culmo enodi, paniculâ erectâ, capsulâ coloratâ nitidissimâ. *Compend. Flor. Brit.* 55. *Eng. Bot.* xxx. 2143.

J. foliis compressis, panicula composita erecta, calycis foliolis tribus exterioribus ovato-lanceolatis acuminatis; interioribus scarioso-marginatis obtusiusculis, capsula ovata triquetra, stylo brevi terminata fusco-purpurea nitida, culmo 3—6-folio. *Davies, Linn. Trans.* x. 13.

J. *articulatus*, culmo adscendente, foliis nodoso-articulatis compresso-teretiusculis, panicula composita, foliolis calycinis æqualibus obtusiusculis. *Willd.* ii. 211.

J. *articulatus*, foliis nodoso-articulatis, petalis obtusis. *Sp. Pl.* 465. *Leers*, 88. *t.* xiii. *f.* 6. *Huds.* 149.

J. *compressus*, culmo folioso decumbente, foliis compressis nodoso-articulatis, panicula composita. *Relh.* 141. *Sibth.* 114. *Abbot*, 79.

J. foliis articulatis compressis, panicula semel ramosa. *Hall. Hist.* 1322.

J. foliis articulosis floribus umbellatis. *Raii Syn.* 433.

Gramen junceum articulatum palustre humilius utriculis frequenter donatum. *Moris. s.* viii. *t.* 9. *f.* 2.

Gramen junceum aquaticum Bauhini folio articulato et cum utriculis. *Park.* 1270. 5.

Angl. Shining-fruited Rush. Lesser-jointed Rush. Shining-fruited jointed Rush.

Habitat in locis uliginosis et paludosis.

Peren. July, August.

Root creeping. *Stem* about a foot high, compressed, many-leaved, slightly striated. *Leaves* compressed, sheathing, distinctly jointed, rigid, pointed. *Panicle* terminal, erect; branches stiff, elongated, nearly simple. *Flowers* five or six together, sessile. *Calyx-leaflets* shorter than the capsule; the three inner somewhat longer, and with a more obtuse and membranous edge than the outer ones. *Capsule* larger, oval, triangular, chocolate-coloured, varnished, acute, terminated by the persistent style.

This plant in an advanced state is easily known from *J. acutiflorus* and *obtusiflorus* by its large, shining, dark capsules. While early in flower, the best marks are the more simple panicle and the somewhat obtuse calyx. It is subject to become foliaceous in the flower-scales; in which state C. Bauhin has figured it, *Prod.* 12., and Parkinson has copied it, 1270. *Gramen aquaticum, Ger.* 12. 1. and *Ger. Em.* 13. 1., which are usually referred to this species or the following, are more likely, judging from the panicle, to be *Alisma Plantago*, drawn as it appears after having seeded. This I have but little doubt is Linnæus's *articulatus*; for though his description "petalis obtusis" is not so applicable to this species as

to

to *obtusiflorus*, yet, as compared with *acutiflorus*, it is sufficiently characteristic. His synonyms are quite consistent with this opinion. This by the old botanists was called the *aquaticus*, while the *acutiflorus* was called *sylvaticus*. Linnæus himself makes this distinction in his *Systema Naturæ*. We are indebted to the Rev. Hugh Davies for making them intelligible to the English botanist.

21. Juncus obtusiflorus.

Juncus foliis teretibus nodoso-articulatis, paniculâ supradecompositâ divaricatâ, calycis foliolis ellipticis obtusis capsulæ longitudine.

J. foliis cauleque nodoso-articulatis teretibus, paniculâ divaricatâ, calyce obtuso longitudine capsulæ. *Compend. Flor. Brit.* 55. *Eng. Bot.* xxx. 2144.

J. foliis teretibus, panicula terminali supradecomposita divaricato-refracta, calycis foliolis ellipticis obtusis, capsula ovato-acuminata triquetra, culmo bifolio. *Davies, Linn. Trans.* x. 13.

J. foliis nodoso-articulatis, floribus obtusis. *Ehrh. Gram.* 76.

J. articulatus β. *Flor. Brit.* 379. *exclus. synonym.*

Gramen junceum sylvaticum. *Ger.* 20.

Angl. Blunt-flowered Rush. Blunt-flowered jointed Rush. Wood Rushie Grass.

Habitat in stagnis et aquosis, non vulgaris.

Peren. July, August.

Stem erect, two or three feet high, smooth, even, cylindrical, divided into cells between the joints, bearing usually two leaves. *Leaves* rigid, jointed, cylindrical, smooth, pointed; joints cellular. *Panicle* terminal, very much branched; branches repeatedly compound, entangled one with the other; ultimate branchlets frequently refracted. *Flowers* small, lateral and terminal,

terminal, collected into little heads. *Calyx-leaflets* elliptic, all obtuse, as long as the capsule; margin broadly scariose; keel brown. *Capsule* light-brown, shining, small, oval, mucronate, three-sided, three-celled.

The pale much branched panicle distinguishes this at first sight; and, upon closer examination, the obtuse calyx-leaflets, which are as long as the capsule, and the jointed stem having only two leaves, afford further marks for discrimination. This is no doubt what Gerard has figured *p.* 20. *f.* 10. and which in Johnson's edition is changed for *acutiflorus*; and it is what Ray, in his *Hist. Plant. p.* 1307. 4., has described as a variety of the same plant.—"Cum planta," he says, "in aquosis et humidioribus nascitur, majis sparsa et pluribus capsularum agminibus composita quàm in præcedente. Quamvis autem planta ipsa major et elatior sit quàm illa, capsulæ tamen seminales minores sunt, nec adeò obscurè nigricant." It is also Ray's plant, mentioned in his *Synopsis*, 2*d ed. p.* 276., where he says, after describing *acutiflorus*, "Secunda species elatior et major est, paniculâ majis sparsâ, capsulis tamen minoribus minusque coloratis quàm in illa." Dillenius understood the expression "secunda species" to refer to the second species of the subdivision in which the plant is placed; whereas Ray meant the *second* as following that he was then describing, which was *acutiflorus*. Thus, in the third edition (in which the species are differently arranged,) Dillenius, speaking of this plant, says, "Priori elatior et major est, panicula majis sparsa est," &c. &c., applying these words to *J. lampocarpus*, which was the second species of the second edition, and which he in his new arrangement had placed next before *acutiflorus*.

LUZULA.

LUZULA.

Woodrush.

Cal. hexaphyllus. *Cor.* nulla. *Caps.* supera, trivalvis, unilocularis, trisperma.

1. Luzula pilosa.

Luzula paniculâ cymosâ divaricatâ, floribus lateralibus sessilibus solitariis, seminis corunculâ uncinati.

L. foliis planis pilosis, corymbo terminali subcomposito, pedunculis unifloris nutantibus, petalis ovatis capsula brevioribus. *Willd. Hort. Berol.* 393.

L. *vernalis*, foliis pilosis, corymbo subsimplici, pedunculis unifloris nutantibus, perigonii lobis ovatis acutis, capsulis obtusis. *Decand. Flor. Gall.* 151.

Juncus pilosus, foliis planis pilosis, corymbo subsimplici, pedunculis unifloris nutantibus, petalis capsula brevioribus ovatis acutis. *Willd.* ii. 216. *Rost. Monograph.* 25.

J. *pilosus*, foliis planis pilosis, panicula cymosa divaricata, floribus solitariis. *Flor. Brit.* 384. *Eng. Bot.* xi. 736.

J. *pilosus*, foliis planis pilosis, corymbo ramoso. *Sp. Pl.* 468. *Huds.* 151. *With.* 349. *Relh.* 145. *Sibth.* 115. *Curt. Lond. f.* 5. *t.* 25. *Leers* 90. *t.* xiii. *f.* 10.

Gramen nemorosum hirsutum vulgare. *Raii Syn.* 416.

Gramen hirsutum latifolium majus. *Moris. s.* viii. *t.* 9. *f.* 1.

Gramen nemorum hirsutum majus. *Park.* 1184.

Gramen hirsutum nemorosum. *Ger.* 17. *Ger. Em.* 19.

Angl. Hairy Woodrush. Small Hairy Woodrush. Hairy Rush. Common Hairy Wood-Grass. Hairy Wood-Grass.

Habitat in nemorosis et dumosis, vulgaris.

Peren. Mar. Ap.

Root fibrous, stoloniferous. *Stem* from 6 to 12 inches high, slender, cylindrical,

cylindrical, simple, leafy. *Leaves* linear-lanceolate, plane, nerved, acute; the margin, especially towards the base, clothed with very long, white, soft hairs: radical leaves very numerous and large. *Panicle* terminal, cymose, somewhat branched, divaricate: ultimate branches reflected. *Flowers* solitary, terminal and lateral; lateral ones sessile. *Bractes* two to each flower, membranous, acute. *Calyx-leaflets* lanceolate, acuminate, dark-brown, with a scariose margin. *Filaments* very short. *Capsule* one-celled, three-sided, inversely heart-shaped, obtuse, suddenly narrower towards the middle. *Seeds* three, shining, chocolate-coloured; coruncula lengthened at the top, hooked, twisted, all three meeting at the insertion of the pistil. *Vid.* Tab. IX. *f.* 1.

The peculiar shape of the coruncula will at once enable the botanist to distinguish this plant from all its congeners; but when that cannot be seen, the divaricate and dark panicle will generally suffice to separate it from *L. Forsteri*; and the solitary flowers prevent it from being confounded with the rest of the British species. The marginal hairs of this genus are singularly constructed, being composed of a number of smaller fibres, which are jointed and twisted; so that upon the application of moisture, in a dry day, as in the case of the awns of *Avenæ*, they untwist themselves.

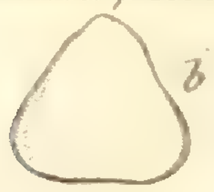
This plant has no known medicinal or agricultural use. Its dry tough herbage renders it unfit for cattle in general; though horses, goats, and sheep will eat it; more, however, from its being one of the earliest spring plants than from any other cause.

2. Luzula Forsteri.

Luzula paniculâ cymosâ erectâ, floribus solitariis, capsulis acutis, seminis corunculâ subrectâ obtusâ.

L. foliis pilosis, corymbo subsimplici, pedunculis unifloris erectis, perigonii

1. *Luzula pilosa*



2. *L. Forsteri*

3 *L. Sylvatica*

4 *L. campestris*

a. Capsule
b. Transverse Section of do
c. Seed
d. Perisperm

J. Curtis sculp.

perigonii lobis ovato-acuminatis, capsula mucronato-acuta. *Decandolle, Syn.* 150. *Ib. Icones Plant. Gall.* i. *t.* 2.

Juncus Forsteri, foliis planis pilosis, paniculâ cymosâ erectâ, floribus solitariis, capsulis acutis. *Eng. Bot.* xviii. 1293. *Flor. Brit.* 1395.

Angl. Forster's Woodrush. Narrow-leaved Hairy Rush.

Habitat in nemorosis calcareis et glareosis.

Peren. May.

Root fibrous. *Stems* from 6—12 inches high, very slender, erect, simple, cylindrical, smooth, leafy. *Leaves* linear, narrower than in the preceding species, acute, hairy at the margin; upper ones largest. *Panicle* terminal, cymose, erect, spreading, a little branched; branches never divaricate or refracted. *Calyx-leaflets* lanceolate, acuminate, light-brown, as long as the capsule. *Capsule* one-celled, roundish-ovate, acute, mucronate. *Seeds* three, oval; coruncula straightish, obtuse, all meeting at the insertion of the pistil. *Vid.* Tab. IX. *fig.* 2.

No doubt whatever can be entertained with regard to the correctness of this being made a species. It was first discovered by Edward Forster, Esq. F.L.S., whose acuteness in indigenous botany has been rarely equalled, and published in the 18th vol. of *English Botany*. Its pointed capsule, peculiarly shaped coruncula, and ascending cyme, are invariable marks to distinguish it. The leaves are not half the width of those of *pilosa*. The *calyx-leaflets* are longer, much more acuminate, and of a lighter colour. The solitary flowers are peculiar to these two species. The figure given by Decandolle is very satisfactory, but somewhat stiff.

3. Luzula sylvatica.

Luzula paniculâ cymosâ decompositâ, floribus fasciculatis, corunculâ obsoletâ.

L. *maxima*, foliis planis pilosis, corymbo decomposito divaricato, capitulis subtrifloris, petalis aristatis longitudine capsulæ. *Willd. Hort. Berol.* 393.

Juncus maximus, foliis planis pilosis, corymbo decomposito divaricato, capitulis subtrifloris, petalis aristatis longitudine capsulæ. *Rost. Monograph.* 28.

J. *maximus*, foliis planis pilosis, corymbo decomposito, pedunculis elongatis divaricatis subtrifloris, calycinis foliolis aristatis longitudine capsulæ. *Willd.* ii. 217.

J. *maximus*. *With.* 349.

J. *sylvaticus*, foliis planis pilosis, corymbo decomposito, floribus fasciculatis sessilibus. *Huds.* 151. *Sibth.* 116. *Curt. Lond. f.* 5. *t.* 26.

J. *sylvaticus*, foliis planis pilosis acuminatis, paniculâ cymosâ decompositâ, floribus fasciculatis. *Flor. Brit.* 385. *Eng. Bot.* xi. 737.

J. *pilosus* ♂. *Sp. Pl.* 468.

Gramen nemorosum hirsutum latifolium maximum. *Raii Syn.* 416.

G. hirsutum latifolium majus, juncea panicula. *Moris. s.* viii. *t.* 9. *f.* 2.

G. hirsutum latifolium minus. *Ibid.*

G. nemorum hirsutum latifolium minus juncea panicula. *Park.* 1185. 3.

G. hirsutum angustifolium majus alterum. *Ibid.* 5.

Angl. GREAT WOODRUSH. Wood Rush. Great Hairy Wood Rush. The greatest broad-leaved Hairy Wood-Grass.

Habitat in sylvis, nemorosis et montosis.

Peren. May, June.

Root fibrous. *Stems* a foot or more high, erect, striated, leafy.

Leaves

Leaves linear-lanceolate, acuminate, eight-nerved, hairy at the margin; stem-leaves smaller, shorter. *Panicle* terminal, cymose, repeatedly compound, often divaricate. *Flowers* small, about three together, fasciculate. *Bractes* linear, hairy, acute. *Calyx-leaflets* equal, acuminate, somewhat longer than the capsule. *Capsule* ovate, mucronate, three-seeded. *Seeds* elliptical; coruncula sitting close to the seed, and of the same shape. *Vid.* Tab. IX. *fig.* 3.

Linnæus comprehended this, with some other real species, in his *Juncus pilosus*; but that it is most distinct from every other, no botanist now doubts. It is the largest of the genus, whence the name *maximus*: but though this be the case, it has a smaller seed-vessel, in proportion, than any of the rest. It differs from *L. pilosa* and *Forsteri* in the circumstance of the flowers growing in clusters, and the repeatedly compound panicle; and from the *campestris*, in the absence of the spiked heads. It flowers later than the others by a month. The herbalists Bauhin, Parkinson, and Morison have two varieties of it, a larger and a smaller; but whether this has arisen merely from the different size of the plant, or whether there is really a distinction, as I confess I have sometimes suspected, I cannot at present determine. Parkinson's 1185. 5. is *Luzula albida*. His *Gramen nemorum hirsutum majus alterum precox tuberosa radice*, 1184. 2. is the large variety; 1185. 3. is the smaller one, copied from C. Bauhin. Morison's *Gramen hirsutum latifolium majus juncea panicula, sect.* viii. *t.* 9. *f.* 2. is the larger; and *Gramen hirsutum latifolium minus* the smaller, and copied also from C. Bauhin. Whether any old botanist besides Bauhin was acquainted with it, is doubtful. *Flor. Dan.* 441. represents the small variety.

4. Luzula campestris.

Luzula culmo tereti, spicis umbellatis sessilibus pedunculatisque ovatis, capsulis muticis.

L. spicis capituliformibus subumbellatis inæqualiter pedunculatis; intermediâ sessili, perianthii foliolis æqualibus acutissimis. *Brown, Prod. Flor. Nov. Holl.* 591.

L. foliis planis pilosis, spicis pedunculatis umbellatis, intermedia sessili, petalis mucronatis capsula longioribus. *Willd. Flor. Berol.* 394.

Juncus campestris, foliis planis pilosis, spicis pedunculatis umbellatis, intermedia sessili, petalis mucronatis capsula longioribus. *Rost. Monograph.* 44.

J. *campestris*, foliis planis pilosis, spicis pedunculatis umbellatis, intermedia sessili, calycinis foliolis mucronatis capsula longioribus. *Willd.* ii. 221.

J. *campestris*, foliis planis pilosis, spicis terminalibus sessilibus pedunculatisque, capsulis obtusis. *Flor. Brit.* 385. *Eng. Bot.* x. 672.

J. *campestris*, foliis planis subpilosis, spicis sessilibus pedunculatisque. *Sp. Pl.* 468. *Leers* 91. *t.* xiii. *f.* 5. *Huds.* 152. *With.* 350. *Relh.* 145. *Sibth.* 116. *Curt. Lond. f.* 2. *t.* 19.

G. hirsutum capitulis Psylii. *Moris. s.* viii. 9. *f.* 4.

G. nemorum hirsutum minus angustifolium. *Park.* 1185. 6.

Gramen exile hirsutum. *Ger.* 16. *Ger. Em.* 17. *Raii Syn.* 416.

β. congesta, altior, capitulæ oblongæ congestæ aut longè pedunculatæ.

Luzula *congesta*. *Forster's Flor. Tonbridg.* 44. *Flor. Fran.* v. 305.

L. *erecta* α & β, culmo erecto elato, capitulis ovatis inæqualiter pedunculatis strictis; capsulis ovatis perianthio longiori; radice cæspitosa. *Desv. Journ.* i. 156, 157.

L. *multiflora*.

L. *multiflora.* *Flor. Fran.* v. 306.
Juncus *erectus.* *Pers. Enchirid.* i. 386.
J. *liniger.* *With. 4th ed.* 436.
J. *campestris* γ. *Sp. Pl.* 468.
Gramen hirsutum elatius, panicula juncea compacta. *Raii Syn.* 416.
G. hirsutum capitulo globoso. *Park.* 1186. 9. *Moris. s.* viii. *t.* 9. *f. sinist.*
G. capitulis globosis. *Ger.* 16. 1. *Ger. Em.* 18. 3.
Angl. Small Woodrush. Hairy Field Rush. Field Rush. Small Hairy Wood-Grass. Hairy Grass. β Globe-headed Rush. Hairy Grass, with a compact rush-like panicle. Round-headed Silver Grass.
Habitat in pascuis siccioribus: β in humidis.
Peren. April, May.
Root fibrous, creeping. *Stem* four inches or more high, simple, erect, leafy. *Leaves* linear, plane, five-nerved, hairy at the margin; point rigid. *Flowers* in spikes, sessile, ten or twelve together; heads ovate, erect, at last nodding; the lowermost sessile, the rest pedunculated. *Bractes* three or four at the foot of each flower, membranous, fringed, shining, giving a silvery appearance to the flowers. *Calyx-leaflets* lanceolate, acuminate, shining, keeled. *Filaments* very short. *Capsule* obovate, obtuse, three-sided. *Seeds* reniform, roughish, ash-coloured green, opake; coruncula enlarged at the bottom of the seed, and attaching it to the receptacle. *Vid.* Tab. IX. *fig.* 4.
β. Taller, leaves longer, panicle composed either of many heads clustered into one, or several little ovate heads of flowers standing on long peduncles in somewhat of an umbellate form.

Though the real *Luzula campestris* is not likely to be mistaken, if its spiked flowers and obtuse capsule be attended to, yet it varies

ries so much, according to the soil in which it grows, as to render it difficult to assign the limits between it and β, and some of the foreign species. Many botanists indeed have considered the bog variety as a distinct species. Ray, Dillenius, Sibthorp, Withering, and the French botanists are of this opinion. On the other hand, Linnæus, Willdenow, Curtis, and Sir James Smith regard it only as a variety. To the latter opinion I assent after much examination. Sir James Smith, *Flor. Brit.* 386. in his β has only described that variety growing in bogs with a conglomerate head, composed, as Ray says, "ex pluribus veluti globulis coacervata;" but mine includes not only this, but another, equally common, the γ of Linnæus, where the little heads stand on long footstalks, growing something like the one figured by Linnæus, *Flor. Lap. t.* x. 2., and yet totally distinct from it. Sir James Smith is at a loss to reconcile Ray's synonyms; but all the figures to which he refers are without doubt intended for the plant in its pedunculated state. Desvaux has made Linnæus's β and mine a new species, which he calls *Luzula erecta*, as above quoted. I cannot, however, agree with this arrangement, being quite satisfied that Linnæus's plant, *Flor. Lap. l. c.*, is a good species, and is to be known by the leaves being narrower and nearly destitute of hairs, the stems compressed, and spikes umbellated. Wahlenburg, who has given it a place in his valuable *Flora*, calls it *Juncus pallescens*, with this definition: "foliis planis, culmo compresso, spicis umbellatis oblongis pedunculatis patentibus, bractea foliacea." I have not observed it in any collection of British plants, though it is very likely to be a native of the northern mountains.

5. Luzula spicata.

Luzula spicâ racemosâ nutante, spiculis sessilibus bracteatis, capsulis acutis.

Juncus

Juncus spicatus, foliis planis subpilosis, spica glomerato-racemosa basi divisa nutante, petalis longitudine capsulæ. *Rost. Monograph.* 46.

J. *spicatus*, foliis planis, spicâ racemosâ nutante basi compositâ, capsulis acutis. *Flor. Brit.* 386. *Eng. Bot.* xvii. 1176.

J. *spicatus*, foliis planis, spica racemosa nutante. *Sp. Pl.* 469. *Fl. Lap. t.* 10. *f.* 4. *Flor. Dan.* 270. *Huds.* 650. *With.* 350.

Angl. Spiked Woodrush. Spiked Rush. Alpine nodding Rush.

Habitat in alpibus Borealibus.

Peren. July.

Root fibrous, tufted. *Stem* simple, six or eight inches high, slender, leafy. *Leaves* linear, channelled, hairy at the base; stem-leaves convolute or subulate. *Spike* terminal, nodding, cylindrical, oblong, obtuse; spikelets sessile, many-flowered, bracteated. *Bractes* pale, lanceolate, laciniated. *Calyx-leaflets* lanceolate, acuminate. *Capsule* pointed, one-celled, three-sided.

This plant approaches nearer to the *Junci* than any of the rest of the *Luzulæ* here described. Its leaves are not so flat or hairy as most of the rest of the genus, and the capsule shows the rudiments of dissepiments. It is not likely to be confounded with any other plant, with the exception, perhaps, of *L. pediformis*, which is much larger, and has a pointed capsule. It is very rare with us, occurring chiefly in Scotland on the summits of the highest mountains. I found a single specimen in the herbarium of my friend Joseph Woods, Esq. F.L.S., gathered by him on Fairfield, near Ambleside; and this is the only instance that has come to my knowledge of its being found in England.

XVIII. *Descriptions of two new Shells. By Captain Frederic Marryat, R.N. F.L.S.*

Read February 18, 1817.

MITRA.

MITRA ZONATA.

TAB. X. FIG. 1, 2.

MITRA epidermide luteâ fulvo-marmoratâ, anfractibus infernè basi nigris, columellâ quinque-plicatâ.

Habitat in mare Mediterraneo.

Anfractus basi nigri, crenato-striolati.

This shell was taken up near the port of Nice in the Mediterranean, adhering to a sounding-lead, in very deep water. I have no hesitation in pronouncing it to be a new species, as I cannot find it described by any author.

CYCLOSTREMA.

CHARACTER GENERICUS.

Testa depressa, perspectivo-umbilicata; apertura circularis.

CYCLOSTREMA CANCELLATA.

TAB. X. FIG. 3, 4.

C. testâ albâ, lineis longitudinalibus et transversis elevatis decussantibus, inde cancellatâ.

Habitat

1

2

3

4

Habitat ——

Apertura labiis cancellatis, cancellis transversim striatis.

I found this beautiful little shell among a collection of chiefly West India shells. According to the Linnæan system, it would come under the genus *Turbo*; but with the advice of Dr. Leach, I have distinguished it as a genus, under the title of *Cyclostrema*. *Helix depressa* and *serpuloides* of Montagu are referable to the same genus.

XIX. *Descriptions of five British Species of the Genus Terebella of Linné. By the late George Montagu, Esq. F.L.S. Communicated by William Elford Leach, M.D. F.R.S. and L.S.*

Read March 4, 1817.

TEREBELLA.

Gen. Char. Body long and annulated, furnished on each side with pedunculated feet terminated with bristles, which are retractile: head with numerous long simple capillary appendages: three small ramified branchiæ on each side behind the head.

The animals of this genus either prepare a sheath from the tenacious secretion of their bodies mixed with adventitious matter, or reside in prepared perforations at the bottom of the sea. The tubes which are prepared by them are in general so extremely delicate, that they are very easily destroyed, and they are then found lurking beneath stones, or forming a new habitation by connecting together sand or mud with the slimy secretion of their bodies. Some species form a tube in old shells or stones, to which they adhere by the whole length; others fix a tube perpendicularly in the sand, with two or three inches projecting above the surface. Many are gregarious, and so numerous, that we have seen the shore covered with the fragments of their tubes after

Eliza Dorville del.

after a storm: thus, from the fragility of their tubes, these animals are often found at large. When in their tubes, generally but a small part is protruded, excepting the capillary tentacula, with which they seem to be searching for food in every direction by thrusting them into cavities of shells, under stones, &c.

The branchial appendages are usually coloured with orange or red whilst the animals are alive and in health, but lose their colour as they become weak or sickly, which probably arises from languid circulation.

The mouth is in front, and the under-lip usually projects so as to make the opening upwards.

All the species inhabit the sea.

Spec. 1. TEREBELLA GIGANTEA.

TAB. XI.

T. with seventeen pairs of exserted fasciculi and eight dorsal plates.

Body long, with numerous articulations furnished the whole length with peduncles, and a few with fasciculate bristles; but the seventeen anterior joints have the fasciculi most conspicuous, being always erected, and remaining so after death: the first eight joints have a broad plate on the back different in structure from the rest; they are of a rufous-brown colour, shaded with purplish-black, continuing down the back in a decreasing line. The general colour of the other parts is yellowish. Beyond the seventeen first joints the peduncles are very small, and appear to be destitute of fasciculi; and they incline gradually from the sides to the back, till towards the extremity they almost meet, forming two dorsal lines: near the mouth originate numerous capillary appendages, that are five or six

inches in length: the three pair of branchiæ are much ramified, and red.

Length sixteen inches.

Inhabits the Devon coast, but is very rare.

T. gigantea is the largest of the discovered species; it inhabits the soil at the bottom of the sea, and seems to be destitute of any case. We found one specimen in the estuary of Kingsbridge at low water: it discharged an orange-coloured fluid from its mouth in great abundance.

Spec. 2. TEREBELLA CIRRHATA.

TAB. XII. FIG. 1.

T. with eleven oval dorsal plates on the anterior articulations.

Body long, with numerous orange-coloured articulations, furnished with small peduncles, and at the anterior end with fasciculi of bristles: branchiæ large and red: mouth with a frill-like membrane beneath, and ciliated above. Capillary appendages four or five inches in length.

Length nearly twelve inches.

Diameter near the head half an inch.

The tube (which is described in *Testacea Britannica* under the name *Sabella cirrhata*) is very fragile; it is composed of sand and clay, and is lodged in the ground, with half an inch projecting above the surface.

This species is gregarious, and is not uncommon on the southern coast of Devon.

Spec.

1

2

Eliza Dorville del.

J. Caries sculp.

1

2

Eliza Dorville del

J. Curtis. sculp.

Spec. 3. Terebella nebulosa.

Tab. XII. Fig. 2.

T. with its body spotted with white, having thirteen dorsal plates.

Body long, orange-red, spotted all over with white. Anterior extremity very tumid, defended by the dorsal plates: anterior peduncles very small, with the fasciculi pointed. The other peduncles and fasciculi are broad. The posterior end is abruptly smaller than the other, as if it had been lost by accident, and afterwards reproduced. The capillary tentacula are numerous, and of a pale orange-colour spotted with white. Branchiæ red with white spots.

Length six or seven inches.

Diameter of the largest part half an inch.

Inhabits the southern coast of Devon rarely, being taken only by deep dredging. Its case is composed of slimy matter, covered with gravel and broken shells.

Spec. 4. Terebella Constrictor.

Tab. XIII. Fig. 1.

T. with twelve broad plates on the back: capillary appendages pale.

Body orange-red, with about one hundred and twenty approximate articulations furnished with small fasciculi; those behind the dorsal plates are divided down the middle by a sulcus: mouth with an expanded lower lip, surrounded with capillary appendages longer than the body.

Length three or four inches.

Inhabits the coast of Devon, and is rare.

The very closely-connected articulations discriminate this species from any of the others. Its case or tube is unknown.

Spec.

Spec. 5. TEREBELLA VENUSTULA.

TAB. XIII. FIG. 2.

T. with orange-red body, thickly and minutely marked with white spots.

First seventeen or eighteen joints furnished with short peduncles and fasciculi: other joints with long peduncles and no visible bristles. Capillary appendages whitish, very slender, numerous, and nearly double the length of the body. We have observed this animal fixing its tentacula, and by contracting them drawing its body forwards.

Length rarely more than three or four inches.

Taken by dredging on the southern coast of Devon at Torcross.

XX. *Characters of two Species of Tordylium. By Sir James Edward Smith, M.D. F.R.S. P.L.S.*

Read March 18, 1817.

I HAVE lately had occasion to remark, in preparing for the Linnæan Society a botanical essay on *Tofieldia*, that scarcely any considerable genus could be taken at random, which would not afford matter for such a dissertation. I had not proceeded far in the alphabetical course of my botanical labours for Dr. Rees's *Cyclopædia*, before an instance of this presented itself, in the long-established and well-known genus *Tordylium*, some of whose species have hitherto never been clearly determined. Our popular guides, such as Willdenow, have left the subject in the same state in which they found it. The details into which I find myself obliged to enter, are beyond the scope of the work above mentioned, and may not prove unworthy of the notice of the learned body whose attention I shall now, for a few minutes, solicit.

The species of *Tordylium* which will come under our examination at present, are chiefly *officinale* and *apulum*, with the *humile* of Desfontaines; except some incidental notice of the Linnæan *peregrinum*, and of Scopoli's *siifolium*.

T. apulum is mentioned by Linnæus in his *Hortus Cliffortianus* 90. *n.* 3, under the following character and synonyms.

T. umbellulis remotis, foliis pinnatis, pinnis subrotundis laciniatis.

T. apulum. *Rivin. Pentap. Irr. t.* 2.

T. apulum

T. apulum minimum. *Column. Ecphr. p.* 1. 122. *t.* 124. *Tourn. Inst.* 320. *Raii Hist.* 412. *Moris. Hist. v.* 3. 316. *sect.* 9. *t.* 16. *f.* 6.

Seseli creticum minimum. *Bauh. Pin.* 161.

A variety is subjoined from Boerhaave's *Hort. Lugd. Bat.* concerning which nothing can be ascertained; and as Linnæus never again adverted to this supposed variety, we must leave it undetermined.

In the first edition of *Sp. Pl.* 239, the *Tordylium* in question appears with the specific name *apulum*, and the above essential characters, with a reference to *Hort. Cliff.* and to Van Royen's *Prodr. Lugd. Bat.* 94. But its other synonyms are limited to Columna and Bauhin, as above cited.

Now it appears that the synonyms of Columna and Rivinus belong to two very different plants. Which of these is to be taken for the *T. apulum* of Linnæus? There being no specimen in his herbarium, the specific character must be resorted to as our safest guide, and this agrees with the plant of Rivinus, not of Columna; "*pinnis subrotundis laciniatis.*" Such was doubtless the plant of the *Hortus Cliffortianus*, which appears by the *Viridarium Cliffortianum* to have been cultivated at Hartecamp, and was therefore seen alive by Linnæus. Such likewise is *T. apulum* of Jacquin, *Hort. Vindob. v.* 1. *t.* 53, which that author afterwards finding not to answer to the synonym of Columna, he thought he had mistaken the Linnæan name, and in the 3d volume of the same work, p. 2, he refers his plant to the Linnæan *T. officinale.*

On the contrary, it appears to me that Columna's figure represents merely a starved variety of *officinale*, under which species I have long ago quoted it, with a mark of doubt, in *Fl. Brit.*; and that Jacquin has described the genuine *apulum* of Rivinus and Linnæus.

These

These species are clearly distinguishable by a character which, though faithfully indicated by Rivinus and Jacquin, has not been fixed upon by any botanist as a specific mark. In *T. officinale* the radiant or dilated part of the marginal flowers consists of two neighbouring petals, each of which has one large, and one very small, lobe; in *T. apulum* there is only one radiant petal to each flower, whose two very large lobes are equal. I would therefore propose the following definitions of the two species in question:

T. *officinale*, involucellis longitudine florum, foliolis ovatis incisis crenatis, petalis radiantibus geminis inæqualitèr bilobis.

T. *apulum*, involucellis flore brevioribus, foliolis laciniatis; superioribus angustatis, petalis radiantibus solitariis æqualitèr bilobis.

The synonyms of the former are correctly given in both editions of *Sp. Pl.* as well as in *Fl. Brit.* 294; to which are to be added *Engl. Bot. t.* 2440, and the unpublished figure in *Fl. Græc. t.* 267. There is every reason to suppose this the original Τορδυλιον of Dioscorides. If Columna had been as exact as usual, his figure would have left us in no doubt respecting the character of the *petals*. But as it is, enough may be discerned for our purpose; and the form of the *leaves*, the length of the partial *involucrum*, and the figure of the *seed*, all agree with *T. officinale*, not with *apulum*.

To the latter belong the synonyms of *Rivin. Pentap. Irr. t.* 2, and *Jacq. Hort. Vind. v.* 1. 21. *t.* 53; which last is quoted in MSS. by Linnæus in his own copy of *Sp. Pl.* This is likewise *T. apulum* of *Prodr. Fl. Græc. n.* 631, from which however must be removed the reference to Columna, and consequently the synonym of Tournefort depending thereon; *Jacq. Hort. v.* 1. *t.* 53, being introduced in their stead. Bauhin's *Seseli creticum minimum* also, being adopted from Columna, belongs to *T. officinale*.

I cannot but consider *T. humile* of Desfontaines, *Fl. Atlant. v.* 1. 325. *t.* 58, as indubitably *T. apulum.* It accords exactly in size and habit with Dr. Sibthorp's Greek specimens. Willdenow, by some accident, has not adverted to this plant.

Scopoli's *T. siifolium*, *Fl. Carn. ed.* 2. *v.* 1. 194. *t.* 8, comes very near to our *apulum*, agreeing in the solitary radiant *petal*, with two equal lobes. But the *flowers* are red, not white; the *leaflets* broader, less divided, and more uniform; and the *fruit* bristly, which last may afford a good specific character. The *general involucrum* moreover is said to consist of only one or two small leaves.

I cannot conclude these remarks without adverting to *T. peregrinum*, *Linn. Mant.* 55. *Sm. Prodr. Fl. Græc. Sibth. n.* 633. This is *Conium dichotomum* of Desfontaines, *Fl. Atlant. v.* 1. 246. *t.* 66, who seems not aware of its being a Linnæan plant. Its seeds indeed bear some resemblance to those of a *Conium*; and the *flowers*, which the able author just cited never saw, are uniform, scarcely radiant. The habit and foliage agree with *Conium* rather than with *Tordylium.* But, on the other hand, the character of the *involucella dimidiata* is not observable, and the crisped margin of the *seeds* answers better to *Tordylium*, though their strongly 3-ribbed disk is adverse, and rather belongs to *Conium.* To the latter genus I should perhaps consent to remove this species. Professor Sprengel, in his *Prodr. Plant. Umbellif.* 12 & 21, refers it to *Cachrys*; but I cannot discover any peculiar coat to the seed, which, according to that learned writer's own principles, might justify such a measure. It is remarkable that he distinguishes the plant of Linnæus from that of Desfontaines, though certainly without any foundation.

Norwich, Feb. 10, 1817. J. E. Smith.

XXI. *Ob-*

XXI. *Observations on a Viper found in Cranborne Chace, Dorsetshire. By the Rev. Thomas Rackett, F.R.S. & L.S.*

Read April 15, 1817.

The Viper which accompanies this paper does not appear to have been noticed by any British naturalist. It is probably *Coluber Chersea* of Linnæus.

Coluber Chersea. *Linn. Syst. Nat.* i. 377. 184. *Gmel.* iii. *p.* 1091. *Fn. Suec.* 285. *Act. Stock.* 1749. *p.* 246. *t.* 6. *fig.* 1. 2. *Laur. Reptil. p.* 97. *n.* 214. *Weigel in Abh. der Hall. Naturf. Ges.* i. *p.* 12.

" *Habitat* in Sueciæ præsertim Smolandiæ, Scaniæ, Uplandiæ, " coryletis et fruticosis depressis, etiam in Pomeraniæ dumetis. " Bero satis affinis, et citius funesta nisi pars morsa statim rese- " cetur. 9½ poll. longus.

" Bero minor, color obscurius spadiceus, caput ovatum, truncus teres."

Linnæus has described this species in the *Swedish Transactions* for the year 1749, and has given a figure which nearly resembles our specimen. The heart-shaped spot on the head is apparent. The belly is quite plain, and has not the appearance of steel observable in the common viper. Linnæus lays great stress on a dark spot near the extremity of the tail, as a distinguishing character of the species: this mark is very evident in the one under examination.

 I received

I received the viper from the Rev. John Tregonwell Napier, Rector of Chettle in Dorsetshire, who killed it in Cranborne Chace. It is extremely rare, but known to the gamekeepers under the name of "THE RED VIPER." A mutilated specimen sent to me last year, was when recent of a bright red colour inclining to orange. The bite is much more venomous than that of the common viper; as I have been assured that a dog which had been bitten by a red viper, expired before he had reached the extremity of a down in his way home.

XXII. *De-*

XXII. *Description of select Indian Plants. By Henry Thomas Colebrooke, Esq. F.R.S. & L.S.*

Read April 15, 1817.

Having had the opportunity, during a long residence in India, of examining some plants, which had not, so far as I know, been previously described, and others which had been but incompletely so, I purpose to submit to the notice of the Linnean Society, in this and successive communications, such of them as appear deserving of remark, either as constituting new kinds, or notable species of previously settled genera.

Under the first head is a plant of which the delineation is here presented under the Indian name; as this seems not unsonorous, nor otherwise objectionable. In general it is desirable to avoid the coinage of new words, and to preserve existing names, whenever they are not too barbarous for admission into the classical nomenclature of botanical science. I propose therefore to retain the Indian term, scarcely altered, for a denomination of the genus; and accordingly to name it *Sabia* from the Hindi *Sabja*.

Under the second head, one of the most remarkable of the plants which will be here offered to the Society's consideration is a species of *Strychnos*, which bears much resemblance to that described and figured by M. Leschenault*, and by him affirmed to be one of two which afford poison used to envenom weapons in

* *Ann. du Mus.* 16. *p.* 479. *pl.* 23.

Java,

Java, and the most deadly of the two which have been there employed for that nefarious purpose. Neither M. Leschenault nor Dr. Horsfield, who has also noticed it*, saw the fructification. But the first of those naturalists has concluded (I presume from the habit) that it is a *Strychnos*. The plant which I take to be nearly allied to it, if not specifically the same, and of which I have examined the fruit, is an undoubted *Strychnos*. It grows in the mountains and forests north and east of Silhet in Bengal; where, from numerous other instances, the flora is known to partake largely of that which belongs to the Malayan peninsula and archipelago. The mountains confining the province of Silhet seem to be the boundary, in the geography of plants, between the hither and remoter India, between the cis-gangetic and trans-gangetic regions.

The specimen of this *Strychnos* was sent to me by Mr. M. R. Smith, who, without being himself conversant with botany, has laboured assiduously in advancing the science by collecting specimens of indigenous plants from countries contiguous to that sequestered province, and by communicating his acquisitions to the botanical garden at Calcutta.

The flowers of this plant have not been seen by me. But the examination of the fruit authorized the pronouncing of it to be a *Strychnos*; which has been verified by Dr. Wallich, the present superintendant of the botanical establishment at Calcutta. It differs from Leschenault's description and drawing, as the leaves are ovate, acuminate; his elliptic, acute. Dr. Horsfield designates the leaves of the Javanese species as in pairs, or pinnate in two or three pairs; egged, spear-shaped, terminating in a long narrow point. Nevertheless, the prominent character of the incrassated tendrils, noticed by Leschenault, raises a surmise that

* *Bat. Trans.* 7.

the

the *Har-cuchila* of Silhet may be the same with the *Tieuté* or *Chitik* of Java.

The Bengalese name, which is that of the *Nux vomica* (*cuchila*), with a distinctive epithet (*hár*), shows that the natives of Silhet have remarked the affinity of these Indian species of *Strychnos*. The specimen was received thence with the information that "the plant has medicinal virtues;" but without any intimation of deleterious qualities in the bark or root. The leaves are used externally as suppurative; and the seed internally as a febrifuge. In a large dose, however, it is said to be poisonous.

In this, as in most, if not in all, the species of the genus, the wood, and still more the bark, are intensely bitter. This is eminently the case in the two species first known and described, *S. colubrina* and *Nux vomica*. They are employed in the Indian practice of medicine, especially the bark of the root; which is administered by native practitioners as a febrifuge. Their seeds are used singly, and in conjunction with opium as an adulteration of that drug, for their narcotic efficacy; and are also employed by venders of ardent spirits to augment the intoxicating power of the liquor vended by them.

In the Javanese species, a decoction of the bark of the root has been ascertained by Dr. Horsfield to be a most active poison when internally administered. The soluble matter of the bark appears also to be the efficient part of it as a mortal venom introduced by a wound.

Notwithstanding the seeming contrast of qualities between a medicine and a poison, it is possible that the same substance, which is deadly in a greater quantity, may be salutary in smaller doses: the presumption, therefore, is not conclusive against the identity of the species indigenous in Java and in Silhet.

Another plant now submitted is a species of a genus named by

by Gærtner *Pygeum*. Nothing more of his plant was seen by him besides the fruit; and as no marked difference sufficient to discriminate the species is presented in the mature fructification, it is possible that the species now described may be the same which he named *Pygeum zeylanicum*. It seems prudent, however, to give provisionally a distinct trivial name to a plant, which most probably is specifically different.

Two plants of the natural order of the *Asclepiadeæ* have been selected for insertion in the present communication: the first of them, a species of *Dischidia*; only one species of that genus having been hitherto described. It was figured by Rumphius, being native of the Molucca islands. The present sort is indigenous in the north-east of Bengal: and the ingenious botanist, by whom the genus was constituted, has intimated, that India possesses other species of it not yet examined in a perfect state*. Another plant now described is a *Tylophora*; in which genus the specific characters of eight sorts have been established by its author: but none I believe have been delineated by figure.

One more plant of a known genus is here described; and, in deference to authorities of the Linnean school, under the generic name of *Macrolobium*. I should be disposed, however, to follow Lamarck in separating very dissimilar plants, which Schreber has collected into one group. If this be allowed, and Lamarck's generic name be retained, the plant now described may be designated *Vuäpa bijuga*.

* Brown's *Prodromus*.

SABIA.

Sabia lanceolata.

J. Curtis sculp.

SABIA.

PENTANDRIA MONOGYNIA: pentapetalous, inferior.

Ess. CHAR. *Petals* lanceolate, persistent. *Stamina* straight. *Drupe* superior, reniform, one-seeded. *Embryo* direct, spiral. No *perisperm.*

SABIA LANCEOLATA.

TAB. XIV.

Native of Silhet, where it flowers in October, and bears ripe seed in May.

Beng. (at Silhet) *Sabjá-lat.*

Stem shrubby, scandent, flexuose. *Leaves* alternate, short-petioled, lanceolate, acute, entire, smooth; 4—6 inches long; 1—1½ broad. *Corymbs* axillary and terminal; forming a loose, ovate panicle: primary divisions ternate. *Flowers* numerous, small; green with a slightly-purplish tinge. *Bractes* minute, ovate, acute. *Perianth* five-parted, acute, persistent. *Segments* ovate. *Petals* five, lanceolate, acute, spreading, smooth, persistent. *Filaments* five, flat, subulate, shorter than the petals, inserted at their base. *Anthers* round. *Germ* round. *Style* columnar, short. *Stigma* simple. *Drupe* reniform, pulpy, dark-blue, size of a kidney-bean, one-seeded, sitting on the permanent calyx and corolla. *Nut* or *Pyrene* solitary, unequally two-lobed, attached by the middle of the smaller lobe a little above the base. *Shell* crustaceous, thin, fragile. *Seed* solitary, attached to the navel by a clavate ligament; honey-coloured; spiral, anfractuous (a single chink on one side, and two on the other, answering to plicatures of the cotyledons). *Integument* single, chartaceous. *Embryo* erect, conform to the seed, white. *Cotyledons* almond-fleshy, writhed (being folded one within the other; plaited once longitudinally and thrice transversely). *Scape* dorsal, curved, filiform. *Radicle* conical, inferior.

REFERENCES.

A. B. C. Flower magnified.
D. E. F. Fruit (natural size).
G. Seed in a state of germination (natural size).
H. The same denuded; or embryo.

STRYCHNOS AXILLARIS.

TAB. XV.

Leaves ovate, acuminate. *Tendrils* axillary, thickened. *Berry* oval, one-seeded.

Native of mountainous countries north and east of Silhet in Bengal; where it blossoms in the hot season, and ripens its fruit in the beginning of the rainy season.

Beng. (at Silhet) *Ar-cuchila*, or *Hár-cuchila*.

Stem shrubby, scandent. *Leaves* opposite, short-petioled, ovate, acuminate, three-nerved, smooth, polished. *Tendrils* axillary, thickening above the middle. *Fascicles* axillary, opposite, branched, corymbose, short-peduncled. *Flowers* small, white. *Bractes* two, opposite, ovate, acute, ciliate, persistent. *Perianth* five-cleft. *Segments* ovate, ciliate. *Corol* tubular, smooth, five-toothed. *Teeth* lanceolate, acute. *Throat* bearded with numerous hoary hairs. *Filaments* from the middle of the tube of the corol. *Anthers* oblong, bearded at the base with copious hoary hairs. *Pistil* shorter than the stamina. *Stigma* subcapitate. *Ovary* two-celled, with numerous ovules affixed to a central receptacle. *Berry* elliptico-globular, size of an olive, yellow (pale orange), sitting on the permanent calyx, one-celled (the second being almost obliterated): filled with gelatinous yellow pulp. *Seed* solitary. *Integuments* double, membranaceous. Exterior invested with dense, short hair, to which

Linn. Trans. Vol. XII. Tab. 25. p. 356

Strychnos axillaris.

I. Curtis sculp.

Dischidia Bengalensis.

J. Curtis sculp.

TYLOPHORA EXILIS.

TAB. XVI.

Panicles terminating in umbellets. *Corolline segments* oval, obtuse. *Leaves* subcordate, acute, smooth, becoming firm, fleshy.

Introduced into the botanical garden at Calcutta in 1810 from Chitagong, of which it is native. Bears flowers and ripe seed in the middle of the rainy season (August).

Stem perennial, simple, scandent, twining with the sun, several yards in length, no thicker than a crow-quill; rooting at the joints if it trail on the ground: young parts thinly beset with soft hairs. *Leaves* opposite, petioled, ovate to cordate, acute or even acuminate, entire, smooth on both surfaces, few-veined: old leaves firm, fleshy. Length 1—2 inches. Breadth half as much. *Petioles* ¼ inch; round, somewhat channelled on the upper edge. *Flowers* small, dilute purple, inodorous. *Panicles* subaxillary, solitary, ramous, lax, dichotomous, or flexuose with alternate divergent pedicels; terminating in umbellets; many-flowered. *Peduncles* slender, round. *Pedicels proper*, somewhat clavate. *Bractes* triangular to ensiform, minute. *Perianth* five-parted. *Segments* triangular. *Corol* rotate. *Divisions* oval, obtuse. *Nectary*, or *stamineous tube*, round at the base, five-angled in the middle. *Germs* ovate. *Styles* most short. *Stigma* flat, pentagonal. *Follicles* oblong, tapering to a pointed apex, round on one side, flat on the other. *Seed* ovate, bracteate, convex without, concave within, papillous, margined, denticulate at the base, cinnamon-colour, crowned with a fascicle of many long silky hairs.

The panicle of this, compared with proliferous umbels of some other asclepideous plants, seems to indicate a derivation from such

which the pulp strongly adheres. Interior thin, brownish. *Perisperm* conform to the seed, undivided, white, semitransparent, horny. *Germ* almost half the length of the perisperm, milk-white. *Cotyledons* cordate, three-nerved. *Radicle* inferior, cylindric, longer than the cotyledons.

Compare with *Strychnos Tieuté*, *Leschenault*, *Ann. du Mus.* 16. 479. *pl.* 23. and *Tshittik*, *Horsfield*, *Bat. Trans.* 7.

DISCHIDIA BENGALENSIS.

Leaves oblong, ancipital.

Native of Silhet, where it is named, like other parasites, *Parárúhá*; and thence introduced into the botanical garden at Calcutta by Mr. M. R. Smith. Flowering season, April.

Roots a few short slender fibres from each joint. *Stem* perennial, parasitic, (by culture, terrestrial,) scandent, radicant, and sometimes twining; round, slender, jointed, lactescent. *Leaves* at the joints, short-petioled, opposite, oblong, obtuse, smooth, firm, fleshy, two-edged, entire, veinless, yellowish-green. Length 1—1½ inch. Breadth ⅓—½. *Petioles* round, less than a quarter of the length of the leaf. *Umbels* from alternate axils: short-peduncled, simple, few-flowered (about 10). *Flowers* very small, yellowish-white, inodorous. *Perianth* five-parted; segments ovate, coloured (white). *Corol* urceolate, five-toothed. *Throat* villous. *Toothlets* ovate, erect. *Nectary*, or stamineous tube, subcylindric. *Stamineous crown* five-leaved. *Leaflets* subulate, bifid. *Segments* lanceolate, reflex, involute. *Germs* ovate. *Styles* short. *Stigma* a pentagonal obtuse pyramid.

The mature fruit has not been seen. But the flower sufficiently marks the genus.

Linn. Trans. Vol. XII. Tab 16. p. 358.

Tylophora asthmatica

J. Curtis sculp.

Macrolobium bijugum.

J. Curtis sculp.

such an umbel by elongation of the ramifications; which, scattering the rays of what should form an umbellet, converts the inflorescence into a panicle.

MACROLOBIUM BIJUGUM.

Tab. XVII.

Flowers triandrous. Six sterile filaments. *Leaves* two-paired.

Whence or how introduced into the botanical garden at Calcutta, where a solitary plant has long been, is uncertain. It flowered there for the first, and, so far as is known, the only time, in 1813, in the hot season; the tree being about eight feet high; and ripened a single legume in September.

Trunk arborescent, erect. *Bark* gray, smooth. *Branches* spreading, dichotomous, drooping towards the extremity. *Leaves* alternate, pinnate, two-paired. *Leaflets* obliquely elliptic, falcate, wavy, polished: 4—5 inches long; 2—2½ broad. *Petioles* swoln at the base; upper edge channelled. *Stipules* none. *Corymbs* terminal, compound; primary ramifications dichotomous. *Pedicels* articulate: upper part gibbous, fistular. *Flowers* white, inodorous. *Bractes* none. *Perianth* four-leaved. *Leaflets* round, concave, downy. *Corol* irregular. *Petal* one, vexilliform, round-cordate, wavy. *Claw* linear, downy on both surfaces. *Wings* and *Keel* none. *Filaments* nine: three antheriferous, filiform, thrice as long as the corol, incurved: six sterile, (a pair on either side of the vexillum, and solitary ones alternating with the fertile;) less than a quarter of the length of the fertile ones: all united at the very base, and free above, dark chesnut-coloured, beset towards the lower end with thinly-scattered white hairs: tips of the sterile filaments hooked, white. *Anthers* linear, incumbent. *Germ* linear-oblong, compressed, villous, containing a few (about eight) globular ovula. *Style*

length

length and situation of the stamina, filiform. *Stigma* headed, two-lobed. *Legume* broad-falcate, compressed, few-seeded. *Seed* black, immersed in lateritious meal: unequally reniform or nearly three-cornered, compressed.

This is seemingly a plant of the same genus with the *Vouapa* and *Simira* of Guiana described by Aublet; from the first of which a genus was constituted by Lamarck (*Illust. Genres*, i. 96). Schreber, followed by Willdenow, has united them with the *Outea* of the same author, in a genus of which the character is taken from the plant last mentioned*. In deference to their authority, the Indian plant is here described under the name assigned by them to the genus; entertaining nevertheless an opinion, that, with the *Vouapas*, it should be separated from that, and formed into a distinct genus with the essential character nearly as given by Lamarck: "Calyx four-leaved or four-parted. A single unguiculate petal. Three fertile stamens opposite to the petal. Legume compressed, few-seeded." The affinity of the Indian plant now described to the *Bauhinia*, *Poinciana*, &c. places it in the natural order of *Cassias*; from which it should not perhaps be disjoined even in the artificial system; as *Bauhinias* with sterile filaments seem to indicate, that its proper place is in the *Decandria* class.

PYGEUM.

Gærtner de Fruct. 1. *p.* 218. *t.* 46. *f.* 4.

ICOSANDRIA MONOGYNIA. *Calyx* inferior, six-toothed. *Petals* six. *Drupe* dry, transversely oblong. *Embryo* inverse, without perisperm.

PYGEUM ACUMINATUM.

TAB. XVIII.

A large tree, native of mountainous countries bordering on

* *Gen. Plant.* no. 62. *Spec. Plant.* no. 78.

Silhet.

Pygeum acuminatum.

J. Curtis sculp.

Silhet. Flowers in the rainy season, and ripens its seed in the cold season, about January.

Beng. (at Silhet) *Ghorma.*

Trunk arboreous. *Leaves* alternate, short-petioled, ovate to broad lanceolate, (sometimes unequal,) acuminate, entire, smooth, shining; 4—6 inches long, $1\frac{1}{2}$—3 broad. *Petioles* $\frac{1}{2}$ inch; round beneath, channelled on the upper edge. *Racemes* length of the leaf, erect, simple, cylindric. *Peduncles* four-cornered, slender, villous. *Pedicels* as long as the flowers. *Flowers* yellowish-green, inodorous. *Perianth* cyathiform, six-toothed, deciduous, leaving a small entire ring at the base of the fertilized germ. *Teeth* subulate. *Petals* six, on the margin of the calycine cup, ovate, villous. *Filaments* numerous (30—40) on the margin of the calycine cup, capillary. *Anthers* round. *Germ* above, roundish, villous. *Style* filiform, length of the stamina. *Stigma* truncate. *Drupe* transversely oblong, juiceless at maturity, size of an olive, dark-purple. *Nut* subreniform, contracted in the middle; *lobes* subequal; crustaceous. *Seed* conform to the nut, attached dorsally a little below the apex. *Integument* single, chartaceous. *Perisperm* none. *Embryo* conform to the seed, inverse, yellowish-white. *Cotyledons* thick, flat on the contiguous ends, and hemispherical on the outer; amygdaloid. *Radicle* superior, very small, conical.

Gærtner, who constituted the genus, saw neither flower nor any other part of the plant besides the fruit: consequently, until his Ceylonese plant has been further examined, it must remain doubtful, as I apprehend, whether the species be distinct: and, at all events, the specific character cannot be yet determined, as but one species is fully described.

XXIII. *Upon*

XXIII. *Upon the different Species of esculent Strawberries. By Thomas Andrew Knight, Esq. F.R.S. & L.S. Pres. Hort. Soc.*

Read May 6, 1817.

Before I enter upon the immediate subject of the following communication, it will be necessary that I define precisely the meaning which I annex to the word species; as that appears to me to be often used somewhat vaguely and licentiously by writers upon botanical subjects. By a species of plants, I mean all plants which can be made to breed together without producing mules; that is, without producing plants which are incapable of affording offspring by seeds: and I consider all plants to be of distinct and different species which cannot be made to breed with each other (if capable of breeding at all), or which, if they intermix, produce mule plants. The peach and nectarine tree have, under my care, bred very freely with the bitter-almond tree; and the offspring do not appear to be mule plants: and I am therefore disposed to question the specific difference of the *Amygdalus communis* and *A. persica*. Similar experiments have led me to doubt the specific difference of the cultivated plum and sloe; and I possess several varieties of the willow, which are not mules, and which appear to have derived their existence from seeds of the *Salix Russelliana*, and the pollen of the *S. alba*; and therefore I am much disposed to question the claims of many of the intermediate supposed species to their present titles.

Many plants of the following species and varieties of strawberries

berries were planted in pots, in different successive seasons, for the purpose of experiment:—the common wood, the white alpine, the Duke of Kent's, or wood-strawberry of Canada, the common scarlet, the Bath scarlet, the pine, the black, the white Chili, and the hautbois, with some others which proved to be varieties of the common scarlet, but to which no particular name had been given. The pollen of the Wood-strawberry was introduced into blossoms of the White alpine, from which the stamina had some days previously been extracted in an immature state. Abundant seeds were produced, which afforded offspring generally similar to their male parent in taste, flavour, and colour. The wood-strawberry of Canada, the common scarlet, the Bath scarlet, the pine, the black, and the white Chili afforded under similar circumstances abundant offspring, however crossed, and the offspring presented every intermediate shade of character between these varieties; but none of them would intermix with the wood or white alpine. The Hautbois did not breed with any of the preceding varieties, except in one instance with the Bath scarlet, from the seeds of which I obtained plants which proved apparently to be mules. I preserved these several years, in which they made feeble and always abortive efforts to produce blossoms. In external character all of these a good deal resembled the hautbois in foliage and general habit; and two of them were not readily distinguishable from plants of that species.

The preceding results, therefore, lead me to conclude that our gardens contain three, and three only, distinct species of strawberry, one of which has sported very widely in varieties.

I much wish that some members of this learned Society would make experiments, similar to those above stated, upon the different species and varieties of plants now comprehended within the genus *Rosa*, *Salix*, *Pelargonium*, and others. Many of the sup-

posed species of each of the preceding genera would, I am very confident, be found capable of breeding with, and being transmuted into, each other, as to their external characters; and if botanical writers still choose to call such species, they ought certainly to distinguish them from others, as secondary or transmutable species. The external form and character of each plant, as it came from the hand of nature, was probably sufficiently peculiar to render it readily distinguishable from those of every other species: but varieties of soil, of climate, and of culture applied for other purposes, have so far mixed and confounded the primary characteristics of many species, that experiments, such as those above described, now afford probably the only source of decisive evidence.

XXIV. *On*

XXIV. *On the Germination of Lycopodium denticulatum, in a Letter to the Secretary from Richard Anthony Salisbury, Esq. F.R.S. and L.S.*

Read June 3, 1817.

Dear Sir,

Professor Brotero's description of the *Lycopodium denticulatum* agrees so exactly with the plant of which I send you some figures, Tab. XIX., that I have nothing to add to it, except that I have never found the capsule three-lobed, as he says it is, but invariably four-lobed: in some positions, however, it appears three-lobed, and he himself mentions that it always contains four seeds.

Notwithstanding I have examined many flowering branches, I have not been able to detect the manner in which the seeds are fœcundated, or to find any thing like an Embryo in them, though they come up in abundance spontaneously under the parent plant, and on the adjacent moist parts of the shelf, where it stands in Mr. Joseph Knight's greenhouse.

The seeds contain at an early period of their formation a clear liquor, which quickly evaporates, and flashes when applied to a candle: this liquor soon becomes milky, and is finally converted into what appears to me grumous albumen.—I am not certain how the seeds are inserted, and believe that I have not yet been so lucky as to meet with a single fœcundated seed, though *perfect* in all other respects; for this occurs in *Cycas*, when there is no male plant to fœcundate its seeds. In one capsule, in which the

seeds had ceased to swell, apparently from their earliest formation, they adhered together to something like a central placenta: in all the other capsules I found them loose, and suspect the placenta had been absorbed by the liquid remaining in the capsule. A very minute hilum remained always visible, and the three-radiated mark originating there appears to me to be only three stronger ribs of the reticulated cuticle of the seed.

The germination of this plant approaches much nearer to that of *Dicotyledones* than to that of *Monocotyledones*, especially if that part which Brotero calls *vitellus* be considered a *radicle*. I am, however, inclined to think that it is true albumen, though it does adhere to the embryo; and till we can succeed in getting plenty of perfect seeds, or to catch them in a still earlier stage of germination than the first figure I now send you represents, this point will remain dubious.

In the mean while, a comparison of the seeds of this *Lycopodium* with those of *Isoetes* and *Pilularia*, which they exactly resemble, will assist us; and as Brotero says that he has seen the part he describes for stigma "*liquore unctuoso diutissime perfusum*," I have little hesitation in believing that it is so: before I read his account, I took the suture at the top, where the capsule afterwards splits, for the stigma, and it is not very unlike the stigma of *Stylidium*.

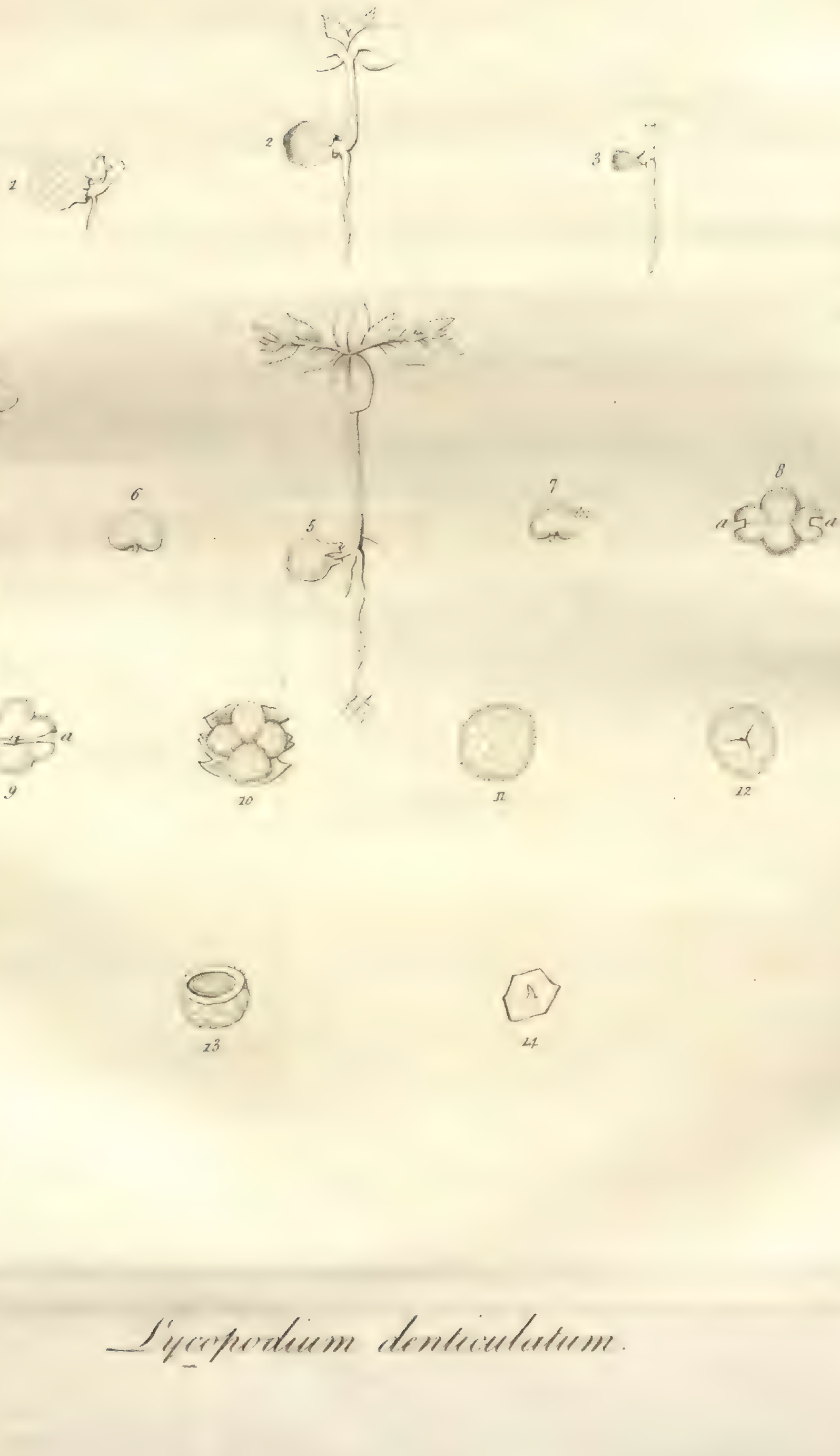
I remain, &c.

18, Queen-Street, Edgeware-Road,
June 3, 1817.

R. A. SALISBURY.

REFE-

Linn. Trans. Vol. XII. Tab. 19 p. 367.



Lycopodium denticulatum.

J. Sowerby sculp

REFERENCES TO THE FIGURES.

TAB. XIX. *Fig.* 1. A seed in the earliest stage of germination yet observed.

2. The same more advanced.

3. Its seed-coat removed to show the *vitellus* of Brotero adhering.

4, 5. Still more advanced.

6. An anther.

7. The same splitting and discharging its yellow pollen: I find no difference between this pollen and that of other *Lycopodiums*, which has been regarded as seed.

8, 9. Upper and under surfaces of a capsule, the latter showing its pedicellus.

a a a a. The part described for stigma by Brotero: it is thinner and more transparent than the rest of the capsule.

10. A capsule burst naturally, with its four seeds.

11, 12. Two views of a seed more magnified, the latter showing its hilum and three-radiated mark.

13. A transverse section, filled with white grumous albumen?

14. One of the reticulated areas of the cuticle, highly magnified, in the centre of which, while young, there is a succulent bristle green at the point.

XXV. *Some Account of the Lycoperdon solidum of the Flora Virginica, the Lycoperdon cervinum of Walter. By James Macbride, M.D. of South Carolina. Communicated by the President.*

Read June 3, 1817.

This fungus is most frequently dug up in lands which have not been cleared of their original wood more than three or four years, in the preparation for planting. It is found at various depths, from a few inches to two feet, and is sometimes met with partly above ground. I have seen it in every variety of soil, except swampy; but it is found in greatest abundance, and appears to attain to the greatest size, in loose rich lands, the forest-trees of which were different species of oak, *Juglans alba*, Linn., and *Pinus Tæda*. It is very common in the southern states; but is rarely seen further north than Maryland. Its shape is irregular; the largest specimens approach the globular form, or the cylindrical with globular ends. I have seen a specimen which weighed fifteen pounds; and I am credibly informed a single tuber has weighed thirty or forty pounds.

The common opinion entertained of this substance is, that it is the root of the *Erythrina herbacea* or *Convolvulus panduratus*, both of which have large roots, and that of the latter penetrating the earth to a considerable depth. The usual appellation of it is *Indian Potatoe* or Indian Bread. It was used by the Indians as an article of food, as their name for it (*Tuckahoe*) is said to imply.

Fugitive

Fugitive negroes sometimes subsist upon it. Deer, the wood-rat (a *Sorex?*), and probably squirrels, feed upon it when it grows sufficiently near the surface of the earth. From the abundance in which it grows, and its nutritious quality, it must have been to the aborigines a considerable source of subsistence, had they known any method of detecting it. The discovery of it now is always accidental.

This fungus is parasitic at first, growing out of the living roots of various trees. It appears at first, in most instances, between the wood of the root and liber; but in some of the smallest specimens accompanying this paper it can be seen only between the lamellæ of the outer bark. It may, like other fungi, emanate from dead wood, but the smallest specimens which I have seen were attached to living roots. During its growth it detaches the bark from the roots, incorporating it with its coat, surrounds the ligneous portion, and gradually assimilates it with its own peculiar internal substance. If during the expansion of the fungus it comes in contact with the root of another tree, it is also assimilated with it. In large specimens no traces of the bark or wood of the original root are discernible. Nothing is known respecting the progress or duration of the growth of the *Tuckahoe*; it has been dug up in lands cleared of wood more than a century.

The outer coat of this fungus is of a dark-brown colour, and roughened by irregular fissures; the inner, if I may be allowed to make this distinction, is coriaceous, resembling that portion of some of the *Boleti* which is used as touchwood; and when a part of the fungus grows exposed, the inner coat of that portion is thickened, and when properly dried is very combustible. The internal substance is insipid, inodorous, of an uniform white, compact, and not disposed in any regular manner; but in fresh

specimens,

specimens, divided transversely, it uniformly cracks in lines perpendicular to the surface. In a solitary specimen, which was very large, I observed something like a disposition of the internal substance in concentric laminæ; but I have macerated many specimens in water, and corroded them by acids, without discovering that such a structure really obtains.

The *Tuckahoe* newly dug up contains little moisture, and soon becomes very hard if kept in a dry place; but in a situation unfavourable to evaporation, a fine white byssus issues from it and envelops it. I have seldom, if ever, seen it undergo any change resembling putrefaction. When exposed a long time to the weather, it crumbles, assumes a ferruginous colour, and becomes acidulous to the taste. The internal substance moistened with water feels slippery. When dried particles of it are pressed between the teeth, they have a cohesive effect; when moistened with water and spread over a hot surface, they form a tough elastic pellicle, which, if exposed to a greater degree of heat, blackens, froths, and emits a smell resembling that of burning bread. When an infusion of galls is added to water in which the tuber has been macerated, a copious white precipitate is thrown down. Sulphuric acid dissolves it, and acquires a purple colour, which in a few days deepens into a black. Water added to this solution causes a dark, flaky precipitate.

From such experiments as I have made with this fungus, I am led to believe its internal part is chiefly composed of gluten, but differently modified from that which we obtain from the *Cerealia*. I have not succeeded in procuring from it any starch or fibrous matter.

In some specimens I have observed portions of the internal substance loose and friable. These were always saccharine and acidulous to the taste.

I am

I am sorry that I am unable to give any information as to the following particulars:

1. How long the fungus continues to derive support from the juices of the roots out of which it grows, and whether it causes the death of the inferior portion of the root.

2. Whether the Indians knew any method of finding it similar to what is practised by the truffle-hunters in Europe. Tradition says they did.

3. The probable quantity of the fungus produced by a given portion of ground.

Charleston, March 28, 1817.

XXVI. *An Account of Rhizomorpha medullaris, a new British Fungus. By Sir James Edward Smith, M.D. F.R.S. P.L.S.*

Read June 17, 1817.

This, which appears to be a nondescript species of *Rhizomorpha*, was communicated to me by Mr. Francis Boott, an American botanist, who met with it during his visit to Derby, in the course of last spring. It was first observed, many months before, by Mr. Bainbrigge, house-surgeon to the Derby Infirmary, and seems to have excited attention as a troublesome intruder into the reservoir destined to supply the baths. That gentleman thus describes the appearance and situation of the fungus in question.

"The reservoir in which it was found is a kind of circular cellar, with an opening at the top. It is situated in the shrubbery, and contains water to supply the baths, which is conveyed by leaden pipes. As the water is sent by a forcing-pump, a piece of timber was fixed across the upper part, to support a perpendicular pipe that admitted the water. From this timber, which was deal, and not in the least decayed, the plant hung, and as the depth of the water varied, a greater or less quantity floated on the surface. I believe the whole of it would be seldom immersed; but the wood, and every part of the plant, would be always wet, in consequence of the water going in with considerable force. I saw the joiner measure the fungus immediately on our getting it out, and he says the length was 12 feet. This I have quite forgotten,

but

but am inclined to think him mistaken. The plant had a beautiful appearance in the water, from the fibres diverging in every direction, and its whiteness, which was lost when it became dry. The extremities were peculiarly brittle. Even the agitation of the water broke off large quantities. This produced great inconvenience, and several attempts were made to destroy the plant, by clearing it away; which not succeeding, the timber was, at length, removed. Oak has been substituted, smeared with tar, pitch and tallow, which has hitherto had the desired effect. The old beam has been used for other purposes."—Such is Mr. Bainbrigge's very accurate account. Mrs. Hardcastle of Derby, to whom I am indebted for the drawings now laid before the Linnæan Society, regrets that she only heard of this curious vegetable production by accident, after it had lain by ten months in a dry state. Her drawing therefore represents this state only, and is here accompanied by a very small portion of the original specimen. This, in its brown and shrivelled appearance, much resembles the roots of willows or poplars, such as often find their way under ground into some adjacent river, or water-course. These have often been brought for my inspection, and I must confess they have led me to doubt the existence of some reputed *Rhizomorphæ*; but I shall in future be more precise in my examinations, lest I should inadvertently confound with them any genuine fungus. That the present is really of the latter description, appears from its history, as well as from the texture of the dried plant, whose internal substance does not, like a root, consist of concentric circles, but of an uniform congeries of longitudinal parallel tubes, in the dried specimen at least, of a yellowish colour. There is nothing like a central pith. And yet the brown external coat, though not separable like the bark of a root, bears so great a resemblance to that part, as almost to stagger my

opinion. The taste of the dried plant has nothing of a fungus-like flavour, but in its slight astringency agrees with many, almost tasteless, roots. The above history of the origin of the plant, from a piece of wrought wood, and its copious growth, must preclude all idea of its being any thing else than a parasitical fungus.

The specific character may thus be given:

Rhizomorpha, *medullaris*, teres ramosissima nivea; intùs cellulosa flavescens.

REFERENCE TO PLATE XX.

Fig. 1. A portion of the stem of *Rhizomorpha medullaris.*
2. Termination of a principal branch.
3. A transverse section of the stem magnified.

London,
June 12, 1817.

J. E. Smith.

XXVII. *A Cen-*

Rhizomorpha medullaris.

J. Curtis sculp.

XXVII. *A Century of Insects, including several new Genera described from his Cabinet. By the Rev. William Kirby, M.A. F.R. and L.S.*

Read November 4, 1817.

The infinite host of non-descript insects occurring in the entomological cabinets of this country, is rather disgraceful to us: and what is more so, we permit foreigners to do that for us which we are fully competent to do ourselves. Witness the numbers described by Fabricius, Olivier, and others from British collections.

Pudet hæc opprobria nobis
Et dici potuisse et non potuisse refelli.

I am not, however, so illiberal as to wish that the entomologists of the continent should be excluded from our cabinets: if we ourselves are too idle, or too busy, to give the public some account of our entomological treasures, it is for the interest of science that they should do it for us.

To remove, in some degree, this opprobrium, I beg leave to offer to the Linnean Society descriptions of a century of the non-descript insects of my own cabinet. Should this attempt meet with approbation, I may be induced, perhaps, to decribe the remainder; and I wish that my example may stimulate other gentlemen to do the same with respect to their own collections.

In my general arrangement I have followed that of my kind

and

and learned friend M. Latreille, in adhering to which I have found that my cabinet contained many insects that could not well be placed in any of his present genera. These I have named and characterized.

COLEOPTERA PENTAMERA.

(*Cicindelidæ.*)

MEGACEPHALA Latreille.

brasiliensis. 1. M. viridis, elytris dorso nigro: macula apicis, ore, pedibusque rufescentibus.

Long. corp. lin. $8\frac{1}{2}$—9.

Habitat in Brasilia. D. Hancock.

M. Carolinæ simillima, sed minus nitida. *Thorax* dorso nigrescit. *Elytra* nigra: margine laterali tantum viridi; macula apicis lineari rufa, nec apex ipse pallidus ut in illa.

The comparative length of the maxillary and labial palpi, upon which this genus is built, seems to me, in this case especially, to indicate a family rather than a genus. The labrum, however, is of a different shape from that of most other *Cicindelidæ.*

CICINDELA Linn.

nivea. 2. C. ænea niveo-pilosa, labro elytrisque glabris albis.

Long. corp. lin. 7.

Habitat in Brasilia. D. Hancock.

Statura fere *C. capensis*, sed paulo angustior. *Corpus* æneum: subtus lateribus, capite thorace pedibusque pilis longis niveis decumbentibus, vestitis. *Labrum* album glabrum. *Elytra* glaberrima, punctulatissima, alba: scutello suturaque æneis, prope basin lineis duabus; interiori longiori, punctorum impressorum

pressorum nigrorum. *Postpectus* * et *abdomen* medio glabra purpurascentia.

(*Carabidæ.*)

SCARITES Fabr.

excavatus. 3. S. ater, elytris elevato-striatis: interstitiis serie punctorum excavatorum.

Long. corp. lin. $17\frac{1}{2}$.

Habitat in Brasilia. D. Hancock.

Corpus lineari-oblongum, atrum, glaberrimum, vix nitidum. *Caput* antice striatulum bisulcum: puncto impresso in utroque sulco, alioque insuper utrinque in vertice. *Mandibulæ* extus elevato-lineatæ, intus dente lato depresso rotundato striato armatæ. *Elytra* striis septem elevatis: interstitiis serie punctorum magnorum excavatorum. *Epipleura* † medio longitudinaliter granulata.

PELECIUM Kirby.

Labrum brevissimum disco excavatum, antice et postice obtusangulum: angulis anum spectantibus.

Labium apice subemarginatum biaristatum.

Palpi articulo extimo magno elongato obtriangulari sive obcuneiformi.

Antennæ filiformes.

Thorax cordato-oblongus.

Tibiæ anteriores intus emarginatæ.

* By this term Mr. Spence and myself have distinguished that part of the body in which the four posterior legs are inserted.

† By this term we designate that part of the elytrum that is under the lateral margin, which often covers the sides of the body, and is remarkable in many *Heteromerous* insects.

This

This genus is distinguished from all others of the tribe by the form of its labrum, and of the last joint of the palpi. It should be placed at the end of Latreille's fifth section, between *Panagæus* and *Cychrus* *.

cyanipes. 4. P.

PLATÆ XXI. Fig. 1.

Long. corp. lin. $7\frac{1}{2}$.

Habitat in Brasilia. D. Hancock.

Corpus oblongum, atrum, glabrum, obscurum. *Caput* subcordatum violascente-nigrum. *Clypeus* distinctus, transversus, quadrangulus; pone clypeum foveolæ duæ longitudinales. *Labrum* tenue, hic inde obtusangulum: angulis anum spectantibus, disco excavatum. *Mandibulæ* capitis fere longitudine, edentulæ, acutæ. *Labium* articulatum, apice subemarginatum biaristatum. *Mentum* magnum, transversum, emarginatum, basin maxillarum tegens. *Palpi maxillares exteriores* quinque-articulati: articulis duobus primis brevissimis, tertio elongato subarcuato, quarto brevi obconico, extimo magno compresso elongato-obtriangulari vel obcuneiformi; *labiales* triarticulati: articulo primo brevi fere obconico, secundo elongato filiformi flexuoso, extimo fere ut in maxillaribus sed paulo majori. *Antennæ* rufæ, basi violascentes: articulis longitudine fere æqualibus: primis quatuor obconicis, sequentibus oblongis: extimo obtuso. *Collum* subglobosum. *Thorax* oblongus vel oblongo-cordatus, quadrangulus, antice latior et emarginatus, postice subrepandus et utrinque sulco impressus: lateribus rotundatis marginatis, dorso canaliculatus. *Scutellum* minutum, triangulare. *Elytra* porcata: porcis septem obtusiusculis, ante mar-

* Cuvier, *Règne Animal*, iii. 197.

ginem

ginem lateralem serie punctorum excavatorum. *Epipleura* angusta, sinuata. *Sternum* elevatum apice anum spectante. *Tibiæ anticæ* intus emarginatæ. *Tarsi anteriores* dilatatæ: articulo penultimo bilobo.

CALOSOMA.

chinense. 5. C. atrum, supra nigro-æneum, scabrum, elytris punctis impressis inauratis triplici serie.

Long. corp. lin. 15.

Habitat in China. D. J. Davie.

Corpus subtus atrum, supra nigro-æneum, obscurum. *Caput* punctulis minutissimis confluentibus impressis irroratum. *Thorax* punctulis rugulisve confertissimis scaber, dorso obsolete canaliculatus, utrinque postice valde impressus. *Coleoptra* oblongo-quadrata, granulis minutissimis numerosissimis exasperata, punctis insuper impressis inauratis triplici serie. *Epipleura* angustissima.

laterale. 6. C. æneum nitidum, thorace elytrisque margine viridi, his striis crenatis, punctis elevatis triplici serie.

Long. corp. lin. 13.

Habitat in Brasilia. D. Hancock.

Corpus subtus atrum, supra æneum nitidum. *Caput* inter oculos confluenter, postice sparse, punctulatum. *Antennæ* apice cinereo-rufescentes. *Thorax* canaliculatus, utrinque impressus: margine omni viridi punctulato; disco læviori. *Elytra* elevato-striata: striis transverse impresso-lineatis; interstitiis punctatis, unde striæ crenatæ videntur. Striæ a sutura tertia, septima, et undecima e punctis elevatis oblongis lævibus: interstitiis viridi-inauratis, constant. Margo lateralis viridis. *Epipleura* antice angusta, postice angustissima et vix ulla.

This insect stands in the Banksian cabinet as *Carabus calidus* Fabr.; but since that specimen was not labelled by Fabricius, and does not agree either with his description or that of Olivier, I conceive my insect to be nondescript.

curvipes. 7. C. nigro-æneum, obscurum, elytris striatis: punctis impressis inauratis triplici serie, tibiis posterioribus arcuatis.

Long. corp. lin. $11\frac{1}{2}$.

Habitat in Brasilia. D. Hancock.

Præcedenti simillimum sed minus, supra magis obscurum, tactu scabrum. *Caput* et *Thorax* punctulis minutissimis confertissimis confluentibus tecta; hic totus concolor postice angustior. *Elytra* fere ut in præcedente, sed unicolora nec margine viridi: striis interstitiis haud punctatis, et omnibus transverse impresso-lineatis. Puncta impressa inaurata triplici serie. *Epipleura* postice magis conspicua. *Tibiæ* quatuor posteriores arcuatæ.

(*Buprestidæ*).

BUPRESTIS.

pulchella. 8. B. elytris acuminatis scabris: fasciis duabus obscuris albis, corpore lineari cyaneo.

Long. corp. lin. $4\frac{1}{2}$.

Habitat in Australasia. D. MacLeay.

Corpus angustum, lineare, cyaneum, punctatum. *Caput* orbiculatum, postice longitudinaliter impressum. *Antennæ* breves, serratæ. *Thorax* ex rugulis transversis scaber, postice utrinque elevatus et in medio foveatus. *Scutellum* transversum, brevissimum, supra linea elevata. *Elytra* amœne violacea, ex granulis complanatis scabra, sericeo-obscura, pone medium utrinque tumida, basi in medio impressa, apice attenuata et extus

mucrone

mucrone valido acuto armata. Fasciæ duæ obsoletæ piloso-albidæ ante apicem in elytro cernendæ.

jucunda. 9. B. elytris serratis cyaneis: fascia postica punctoque laterali sanguineis, thorace canaliculato.

Long. corp. lin. 13.

Habitat in Brasilia. D. Hancock.

Corpus oblongum, subtus viride nitidissimum. *Caput* punctulatum, cyaneum: ore acuminato. *Antennæ* thorace breviores, serratæ, cyaneæ. *Thorax* punctulatus, cyaneus, conicus, antice truncatus, postice utrinque subito dilatatus et in medio sublobatus, dorso canaliculatus. *Scutellum* rotundatum, basi emarginatum, apice impressum. *Elytra* planiuscula, cyanea, striato-punctata, basi impressa, a medio ad apicem serrata, ante apicem fascia lata sinuata et in medio prope marginem externum puncto, sanguineis. *Sternum* magnum, protensum, conicum. *Pedes* cyanei. *Anus* supra rufus.

At first I mistook this beautiful insect for *B. equestris* Fabr.; but the terms—*Corpus æneum—sterno parum porrecto—Elytra punctorum duorum par*, by no means agreed with it: and when I further compared it with Olivier's *B. hæmorrhoidalis*, to which Fabricius refers as synonymous with his *B. equestris*, I was fully convinced that they were distinct species; since from Olivier's figure it appears that *B. hæmorrhoidalis* is little more than half the size of *B. jucunda*; and in the former the three last ventral segments of the abdomen are red, whereas in the latter they are green*.

amœna. 10. B. elytris serratis, apice bidentatis, cyaneis, striatis: fascia postica subarcuata testacea.

Long. corp. lin. $8\frac{1}{4}$—11.

* Fabr. *Ent. Syst. Em.* ii. 195. Oliv. ii. *Buprestis* 32. 38. 47. *t.* x. *f.* 109.

Habitat in Brasilia. D. Hancock.

Affinis præcedenti sed alia. *Corpus* e viridi cyaneum. *Thorax* haud canaliculatus: angulis posticis non dilatatis. *Scutellum* oblongum. *Elytra* subsulcata: sulcis vix conspicue punctatis, ante apicem fascia subarcuata subtestacea aut flava, apice ipso interne bispinoso. *Abdomen* supra et infra concolor.

Var. β. minor, cyanea: elytris fascia vix arcuata lutea: thoracis dorso foveolis binis impressis. An eadem?

leucosticta. 11. B. elytris serrulatis atro-violaceis scabris: punctis sparsis albis, corpore aurato-viridi.

Long. corp. lin. 6—6⅔.

Habitat in Australasia. D. MacLeay.

β. in Mus. D. Brown.

Corpus oblongum, subcylindricum, aurato-viride, punctulatum. *Caput* orbiculatum, excavato-punctatum, cupreo-auratum, inter oculos valde impressum. *Antennæ* breves, æneæ, serratæ. *Thorax* cupreo-auratus, excavato-punctatus. *Scutellum* latum, acuminatum, læve, aurato-viride. *Elytra* atro-violacea, reticulato-rugosa: areolis singulis granuliferis unde tactu scabra, punctis sparsis squamoso-albis irrorata, apice serrulata. *Abdomen* segmentis ventralibus utrinque macula squamoso-alba.

Var. β. capite thoraceque aurato-viridibus; elytris purpurascentibus.

(*Elateridæ.*)

ELATER.

pubescens. 12. E. niger, thoracis lateribus linea intermedia liturisque duabus obliquis, elytrorumque latere exteriori, pallidis.

Long. corp. lin. 9¾.

Habitat in Brasilia. D. Hancock.

Corpus

Corpus lineare, nigrum, ex pube infuscatum. *Caput* inter oculos fovea impressa. *Antennæ* thoracis fere longitudine, serratæ. *Thorax* obtuse canaliculatus: margine laterali et antico, lituris duabus dorsalibus obliquis, lineaque intermedia longitudinali, pallidis. *Scutellum* oblongum. *Elytra* vix striata, basi impressa: margine laterali, apice excepto, late pallida.

inermis. 13. E. testaceus, thorace linea dorsali, coleoptris vittis tribus, antennisque, nigris.

Long. corp. lin. 17½.

Habitat in Brasilia. D. Hancock.

Corpus lineari-lanceolatum, læve, nitidum, glaberrimum, subtus pallide testaceum. *Palpi maxillares* articulo extimo magno, oblongo, subarcuato, subpetiolato, compresso. *Facies* inter oculos pone antennas utrinque longitudinaliter elevata: fossula profunda intermedia. *Antennæ* thoracis longitudine, serratæ, nigræ: articulis duobus primis testaceis. *Thorax* elongatus inæqualis, flavo-testaceus: vitta dorsali nigra, antice obsolete trilobus: lobo intermedio emarginato; lateralibus deflexis, postice etiam trilobus: lobo intermedio truncato; lateralibus acutissimis. *Scutellum* rotundatum. *Coleoptra* punctato-striata, transverse rugulosa, basi impressa, lutea: vittis tribus, intermedia communi, lateralibus per medium elytri a humero ductis, nigris, apice mucronata. *Abdomen* subtus segmento anali foveis binis ovatis excavatis pilosis.

cornutus. 14. E. testaceus, capite bicorni, thorace lineis duabus dorsalibus interruptis, coleoptrisque vittis tribus atris.

Long. corp. lin. 11—15.

Habitat in Brasilia. D. Hancock.

Corpus dilute testaceum, nitidum, subtus utrinque vitta, sæpius interrupta,

interrupta, atra. *Caput* cornubus duobus brevibus porrectis antice armatum, inter cornua impressum, puncto nigro antice et postice signatum. *Palpi* et *Antennæ* fere ut in præcedente. *Thorax* elongatus, antice utrinque angulis porrectis, postice obsolete trilobus: lobis rotundatis, lineis binis dorsalibus pone interruptis, et utrinque supra et infra puncto laterali, atris. *Scutellum* subrotundatum. *Coleoptra* punctato-striata: vittis tribus, intermedia communi, lateralibus marginalibus basin haud attingentibus, atris, apice mucronata. *Abdomen* subtus segmento anali foveis binis oblongis pilosis.

These two insects seem nearly allied to three species of Fabricius, *E. suturalis*, *bicornis*, and *vespertinus*; but at the same time they appear to be quite distinct from them. From the first they are sufficiently distinguished by having no lateral thoracic tooth or spine; from the second in their colour, *E. bicornis* being entirely black; and from the third in the colour of their head and antennæ. From the different shape of the last joint of their palpi, and from the remarkable pair of impressions on the anal segment of the underside of the abdomen, these insects should form a distinct family, if not a distinct genus.

(*Cebrionidæ.*)

ANELASTES Kirby.

Labrum tectum, minutum, apice rotundatum.
Labium subquadratum, bifidum.
Mandibulæ exsertæ, edentulæ, incurvæ, acutæ.
Palpi brevissimi, filiformes. *Maxillares* articulo extimo paulo majori, oblique truncato.
Antennæ filiformes, moniliformes: articulo extimo sublunato.
Corpus lineare, subcylindricum.
Pectus inerme.

This

This genus connects Latreille's tribe of *Cebrionites* (*Cebrionidæ* K.) with the *Elateridæ*. It differs from all the present genera of that tribe in its moniliform antennæ and short palpi, and more especially in having its labrum quite concealed by the clypeus. From *Elater*, which in habit it most resembles, it is distinguished not only by these circumstances, but also by its protended mandibles and deflexed sternum.

Drurii. 15. A.

PLATE XXI. FIG. 2.

Long. corp. lin. 6.

Habitat——Ex Musæo D. Drury.

Corpus lineare, subcylindricum, fuscum, obscurum, scabrum. *Caput* suborbiculatum, thorace receptum. *Labrum* subinflexum, parvum, apice rotundatum, hirsutum, clypeo penitus tectum. *Labium* subquadratum, bifidum. *Mandibulæ* exsertæ, edentulæ, apice incurvæ, acutæ. *Maxillæ* breves: lobo lato, corneo, glabro, apice rotundato. *Palpi* brevissimi, filiformes, *maxillares* articulo extimo obtriangulari. *Mentum* transversum, quadrangulum, disco excavatum. *Antennæ* in sinu frontis anteriori insertæ, thorace breviores, filiformes, moniliformes: articulo primo incrassato reliquis longiori, secundo subgloboso, tertio sequentibus longiori obconico, sequentibus subglobosis, extimo longiori sublunato acuto. *Thorax* convexus, antice transversus, postice dorso canaliculatus, obsolete trilobus: angulis lateralibus acuminatis. *Scutellum* triangulare, acutum. *Elytra* striata: striis punctatis. *Epipleura* vix ulla. *Tibiæ* apice bicalcaratæ. *Sternum* deflexum.

RHIPICERA Latreille.

marginata. 16. R. viridis pubescens, elytris fuscis punctatis: margine omni pallido, pedibus nigris basi rufis.

PLATE

PLATE XXI. FIG. 3.

Long. corp. lin. $10\frac{1}{2}$—12.

Habitat in Brasilia. D. Hancock.

Corpus lineare, subcylindricum, obscuro-viride, mollissime cinereo-pubescens. *Caput* suborbiculatum. *Labrum* rotundatum, apice emarginatum. *Labium* integrum, minutum, hirsutissimum. *Mandibulæ* magnæ, porrectæ, primum divergentes, demum subito convergentes, unde subfractæ evadunt, intus basin versus dente valido acuto armatæ. *Palpi* longi admodum: articulo extimo subovato. *Mentum* transversum. *Antennæ* nigræ, multiarticulatæ, flabellatæ: ramulis circiter 27, a medio basin versus et apicem longitudine sensim decrescentes. *Thorax* subconicus, antice transversus, postice obsolete trilobus: lobo intermedio emarginato, lateralibus acutis. *Elytra* fusca, punctata, margine omni, summo apice excepto, pallide flavo. *Pedes* nigri: femoribus, apice excepto, coxisque rufis. *Tibiæ* apice bicalcaratæ. *Sternum* rufum, acutum, incurvum, vix deflexum. *Abdomen* segmentis plerisque apice obscure rufis.

The Brasil species of this genus vary from those of New Holland (one of which I shall hereafter have occasion to describe) in having only one tooth near the inner base of each mandible; whereas in the latter there are two. The last joint of the palpi of this is cylindrical, while in *R. marginata* it is subovate or ovato-lanceolate. Hence may be formed two natural families in the genus, * *Mandibulis intus unidentatis*; ** *Mandibulis intus bidentatis.*

(*Lampyridæ.*)

LAMPYRIS Linn.

* *Ovatæ.*

Latreillii. 17. L. elytris nigris testaceo-lineatis, antennis masculis disticho-flabellatis, femineis disticho-serratis.

PLATE XXI. FIG. 4.

Long. corp. ♂. lin. 12.

———— ♀. lin. 13.

Habitat in Brasilia. D. Hancock.

♂.

Corpus depressum, atrum, obscurum. *Antennæ* decem-articulatæ, nigræ: articulis intermediis octo utrinque ex apice ramum longum, compressum, linearem, fere foliiformem, flexilem emittentibus, extimo simplici compresso longissimo. *Thorax* pallide testaceus: maculis tribus magnis, intermedio longiori triangulari, nigris. *Elytra* confluenter punctulatissima; margine omni, apice excepto, lineolis tribus obscuris dorsalibus, vittaque hamata a humeris ducta postice abbreviata, pallide testaceis. *Alæ* nigræ. *Abdomen* immaculatum.

♀.

Antennæ undecim-articulatæ, imbricatim disticho-serratæ.

In honorem viri amicissimi, Entomologorum hodiernorum facile principis, D. P. A. Latreille, *Galli.*

Illigeri. 18. L. thorace lituris duabus elytris unica laterali basis, pallidis, antennis flabellatis.

Long. corp. lin. 10.

Habitat in Brasilia. D. Hancock.

Corpus atrum, supra magis obscurum. *Antennæ* nigræ, undecim-articulatæ, intus flabellatæ. *Thorax* reflexus, punctatus, dorso læviusculus gibbus: lituris duabus obliquis pallidis. *Elytra* confluenter punctulatissima; lineis quinque longitudinalibus elevatiusculis in apicem elytri anastomosantibus, vitta marginali basis pallida. *Pedes* basi pallidi. *Abdomen* subtus segmento anali utrinque lucernula* pallida.

In honorem viri doctissimi, et in Entomologia heu desideratissimi, D. Illigeri, *Borussi.*

Savignii. 19. L. thorace fenestrato pallido; dorso margineque nigris: vitta laterali abdomineque pallidis.

Long. corp. lin. $9\frac{1}{2}$.

Habitat in Brasilia. D. Hancock.

Affinis præcedenti, sed distincta. *Corpus* pallidum. *Antennæ* corpore dimidio breviores, nigræ, compressæ, serratæ. *Thorax* pallidus, vix reflexus, supra oculos fenestratus: dorso gibbo margineque nigris. *Elytra* fusco-nigra: lineis quatuor elevatis obsoletiusculis, vitta laterali apicem haud attingente pallida.

In honorem Zoologiæ Ægypti peritissimi interpretis, in Entomologia oculatissimi, D. J. C. Savigny, *Galli.*

(*Cleridæ.*)

I exclude from this tribe two genera placed in it by Latreille, (*Mastigus* Hoff. and *Scydmænus* Latr.), but which, having little affinity with it, had better stand by themselves, and then divide it into two sections: the first containing those with serrated antennæ (*serricornes*), and the second those with clavated (*clavicornes*).

* By this term I distinguish the phosphoric spots on the thorax of *Elater noctilucus*, and those also on the ventral segments of the abdomen of *Lampyris*.

* *Serricornes.*

EURYPUS Kirby.

Labrum transversum, integrum.
Labium bifidum.
Palpi omnes articulo extimo majori, securiformi.
maxillares quadriarticulati.
labiales biarticulati.
Antennæ serratæ.
Thorax subquadratus.
Corpus depressum.

TILLUS Fabr.

Labrum transversum, integrum.
Labium minutum, integrum.
Palpi maxillares filiformes, triarticulati.
labiales biarticulati: articulo extimo maximo, securiformi.
Antennæ serratæ.
Thorax cylindricus.
Corpus convexum.

AXINA Kirby.

Labrum emarginatum.
Labium bifidum?
Palpi omnes articulo extimo magno, securiformi.
maxillares triarticulati.
labiales biarticulati.
Antennæ serratæ.
Thorax cylindricus.
Corpus subdepressum.

PRIOCERA Kirby.

Labrum emarginatum.
Labium bifidum.

Palpi maxillares filiformes, quadriarticulati: articulo extimo compresso, oblongo.

labiales triarticulati: articulo extimo magno, petiolato, securiformi.

Antennæ serratæ.

Thorax teretiusculus, postice valde constrictus.

Corpus convexum.

Latreille's character of *Tillus* in Cuvier's *Règne Animal* *, "où la majeure partie des antennes est en forme de scie, et où les tarses, vus sur les deux faces, ont cinque articles très-apparens," would include the four genera I have here defined. But the other characters exhibited by them, both as to their habit and general form, and their oral instruments, are so different, that every entomologist who at all adopts that learned author's system would consider them as good genera. Thus in *Eurypus* and *Tillus* the labrum is entire, while in *Axina* and *Priocera* it is emarginate. Again, the labium in *Tillus* is entire, but in the three other genera bifid. In *Eurypus* and *Axina* all the palpi terminate in a securiform joint; in *Tillus* and *Priocera*, only the labial ones. In *Eurypus* and *Priocera* the maxillary palpi consist of four joints; in *Tillus* and *Axina*, only of three. In *Eurypus*, *Tillus*, and *Axina* the labial palpi are biarticulate, but in *Priocera* they are triarticulate. In *Eurypus* the thorax is square; in *Tillus* and *Axina*, cylindrical; and in *Priocera*, constricted behind.

EURYPUS.

rubens. 20. E.

PLATE XXI. FIG. 5.

Long. corp. lin. 6.

Habitat in Brasilia. D. Hancock.

* iii. 254.

Corpus

Corpus lineari-oblongum, depressum, nitidiusculum, punctulatissimum, villosulum, rubens. *Caput* suborbiculatum: ore producto. *Labrum* transversum, integrum. *Labium* bifidum. *Mandibulæ* tectæ. *Palpi maxillares* longiusculi, quadriarticulati: articulo primo brevissimo subcylindrico, sequentibus duobus brevibus obconicis, extimo magno obtriangulari, *labiales* biarticulati brevissimi: articulo primo filiformi, secundo majori, sed non magno, obtriangulari. *Mentum* subtransversum quadrangulum. *Antennæ* serratæ? rufæ, apice nigræ. (*In nostro specimine articuli quatuor ultimi desunt.*) *Oculi* prominuli, subhemisphærici. *Thorax* subquadratus, planiusculus: dorso foveis binis impressis. *Elytra* planiuscula, basi latere exteriori, et lineola apicis prope suturam nigris. *Pedes* breves. *Tibiæ* vix calcaratæ. *Tarsi* articulo penultimo latissimo, bilobo.

AXINA.

analis. 21. A.

PLATE XXI. FIG. 6.

Long. corp. lin. 6.

Habitat in Brasilia. D. Hancock.

Corpus lineare, villosum, subtus fuscum, supra pallidum. *Caput* deflexum, orbiculatum, punctatum, rufescens. *Labrum* transversum, emarginatum. *Labium* bifidum? *Mandibulæ* edentulæ. *Palpi* rufi, *maxillares* triarticulati: articulo primo elongato clavato, secundo brevi obconico, extimo magno securiformi, *labiales* articulo primo et extimo ut in maxillaribus. *Oculi* magni, reniformes, villosi, distincte reticulati. *Antennæ* thorace breviores, rufæ. *Thorax* elongatus, cylindricus, punctatus, dorso impressus, rufescens: lateribus fuscis. *Elytra* dorso planiuscula, punctata: lateribus, fasciis duabus; prima ante medium angusta, angulata, intus abbreviata, altera latiori dilutiori

lutiori apicis, punctisque sparsis, fuscis. *Apex* ipse elytri immaculatus. *Pedes* fusci. *Tibiæ* vix calcaratæ. *Tarsi* longius pulvillati. *Abdomen* subtus segmentis duobus ultimis pallide flavis.

PRIOCERA.

variegata. 22. P.

PLATE XXI. FIG. 7.

Long. corp. lin 6.

Habitat in Brasilia. D. Hancock.

Corpus lineare, nitidum, fusco-nigrum, villosum. *Caput* suborbiculatum, deflexum, ex punctis confluentibus inter oculos rugulosum. *Labrum* transversum apice emarginatum. *Labium* bifidum. *Maxillæ* lobo exteriori elongato, rotundato. *Mandibulæ* apice dentatæ. *Palpi maxillares* filiformes, quadriarticulati: articulis tribus primis brevissimis, extimo oblongo subcompresso, *labiales* triarticulati: articulo primo brevissimo, secundo elongato lineari compresso, extimo magno petiolato securiformi. *Mentum* subquadratum, disco excavatum. *Antennæ* rufescentes, capite longiores, serratæ, ex cochlea tubiformi in cantho oculorum sita provenientes. *Oculi* magni, reniformes, villosi, distincte reticulati. *Thorax* fuscus, punctatus, teretiusculus, postice valde constrictus et strangulatus, unde quasi capuciformis, dorso impressus. *Coleoptra* dimidiato-excavato-punctata, apice lævia, rufa: maculis quatuor magnis quadratim ordinatis; anticis duabus humeros occupantibus, posticis fasciæformibus per medium transverse ductis, punctisque intermediis, flavis. Fascia fusca lata pone fasciam mediam flavam cernenda in singulo elytro. Apex immaculatus. *Pedes* fusco-nigri: tarsis rufescentibus; pulvillis elongatis involutis. *Tibiæ* vix calcaratæ. *Abdomen* subtus segmentis apice summo anoque rufis.

** *Clavicornes.*

** *Clavicornes.*

ENOPLIUM Latr.

lituratum. 23. E. pallidum, capite thoraceque rufis, elytris litura arcuata, antennisque, nigris.

Long. corp. lin. 6.

Habitat in Brasilia. D. Hancock.

Corpus obcuneato-lineare, pallidum, pubescens. *Caput* orbiculatum, rufum, punctatum. *Labrum* transversum, emarginatum. *Labium* apice bilobum: lobis rotundatis. *Mandibulæ* edentulæ, apice rotundatæ. *Palpi maxillares* triarticulati: articulo extimo majori subsecuriformi, *labiales* biarticulati: articulo extimo item securiformi. *Antennæ* nigræ: articulo primo rufo, tribus ultimis magnis clavam serratam formantibus. *Thorax* teretiusculus, punctatus, rufus, utrinque vitta nigra: lateribus retusis. *Elytra* punctata, apice latiora, pallida, basi rufescentia: litura angusta laterali arcuata, apiceque summo, nigris. *Pedes* pallidi: duobus anterioribus genubus nigris. *Tibiæ* vix calcaratæ. *Tarsi* articulo primo minutissimo et tantum non obsoleto, supra nigri, subtus longius pulvillati pallidi: articulis intermediis bilobis.

The first joint of the tarsi in this genus is scarcely visible under a strong magnifier; so that they may rather be regarded as tetramerous than pentamerous insects.

viridipenne. 24. E. rufum, elytris aurato-viridibus basi punctato-striatis, abdomine nigro utrinque punctis flavis.

Long. corp. lin. $7\frac{1}{3}$.

Habitat in Brasilia. D. Hancock.

Corpus lineare, rufum, punctatum, subhirtum. *Caput* et *Thorax* figura

figura fere ut in præcedente. *Antennæ* rufæ. *Elytra* auratoviridia, nitidissima, basi seriatim punctata: punctis excavatis, apice levissime punctulata. *Abdomen* nigrum: segmentis utrinque lineola transversa flava.

CLERUS Latr.

Nutalli. 25. C. cyaneus, elytris rubris: sutura, fasciis tribus, punctoque humerali, cyaneis.

Long. corp. lin. 4.

Habitat in America septentrionali, prope flumen Missouri. D. Nutall.

Valde affinis *C. apiario* et *C. leucopsideo* Oliv. ambobus tamen multo minor. A priori præcipue differt statura angustiori, humeris elytrorum puncto suturaque cæruleis, fasciaque antica latiori. A posteriori antennis clava nigra, femoribusque posticis nullo modo incrassatis, bene distinguitur.

(*Histeridæ.*)

HISTER Linn.

Omega. 26. H. ater, nitidissimus, elytris quadristriatis, thoracis lateribus punctulatis, fronte ω Græcorum impressa signata.

Long. corp. lin. 5.

Habitat in Brasilia. D. Hancock.

Corpus latum, subquadratum, læve, nitidum, aterrimum. *Caput* inter oculos litera ω Græcorum (qua nota ab omnibus reliquis Histeribus differt) impressa signatum. *Thorax* dorso lævissimus: lateribus minutissime et absque lente forti vix conspicue punctulatis. Punctum majusculum valde impressum ante scutellum. *Elytra* pone humeros subsinuata, brevissima, quadristriata;

ata: striis tribus, exterioribus interiori longioribus, abbreviatis, externa undulata, levissime exaratis. *Truncus* subtus utrinque lineolis exsculptus. *Tibiæ* anticæ quadridentatæ. *Podex* utrinque punctatus.

HOLOLEPTA Paykull.

flagellata. 27. H. atra, elytris bistriatis, abdomine segmento penultimo utrinque sulcato.

Long. corp. lin. 5.

Habitat in Australasia.

Corpus ovato-oblongum, depressum, nitidum, læve, atrum, subtus lateribus punctatis. *Caput* mandibulis porrectis ascendentibus. *Thorax* utrinque sulco marginali exaratus. *Elytra* apice oblique truncata: angulo exteriori rotundato, tristriata: stria interiori integra, intermedia basis, exteriori apicis, abbreviatis. *Tibiæ* omnes quadridentatæ. *Abdomen* segmento dorsali penultimo utrinque punctato bisulco: sulcis in angulum obtusum latus spectantem conniventibus. *Anus* ipse deflexus punctatus.

(*Nitidulidæ.*)

NITIDULA Fabr.

hemisphærica. 28. N. nigra, supra viridis, abdomine pedibusque flavis.

Long. corp. lin. $2\frac{3}{4}$.

Habitat in Brasilia. D. Hancock.

Statura *N. luteæ* et *quadripunctatæ* Illig. *Corpus* glabrum, subtus planum nigrum, supra valde convexum viride, minutissime punctulatum. *Antennæ* flavæ: capitulo triarticulato, orbiculato, nigro. *Scutellum* maximum, subtriangulare. *Abdomen* cum pedibus flavum.

(*Scarabæidæ.*)

COPRIS.

floriger. 29. C. thorace viridi-æneo: cornubus duobus elevatis, subincurvis nigris, capitis erecto apice complanato subemarginato.

Long. corp. lin. $9\frac{1}{2}$.

Habitat in Brasilia. D. Hancock.

Affinis *C. splendidulo* et *conspicillato* Fabr. sed alia.

♂.

Corpus viridi-æneum. *Caput* nigrum, lateribus postice viridi-æneis. *Clypeus* rugulosus, subbidentatus: cornu thorace breviori erecto, apice complanato subemarginato incurvo, basi dilatato utrinque dente obsoleto obtuso armato. *Antennæ* dimidiato-tunicatæ: articulis lunatis. *Thorax* metallico splendore nitidus, antice dente parvo armatus, utrinque, ante punctum ordinarium excavatum, puncto nigro notatus, postice in medio subacuminatus, dorso foveatus: fovea magna biloba in medio cornubus duobus, longis admodum, acuminato-subtriangularibus: acumine nigro, subincurvis armatus; lateribus postice sinu excisis. *Elytra* substriata: striis quatuor interioribus basi foveatis, nigro-viridia: sutura viridi. *Corpus* subtus nigrum: podice, postpectoris disco, femoribusque supra viridi-æneis. *Tibiæ* anticæ obtuse tridentatæ.

♀.

Femina altero sexu paulo major, clypeo haud cornuto, transverse carinato, thorace antice foveato: fovea parva viridiæneo; dentibus tribus nigris obsoletis obtusis in triangulo obtusangulo dispositis, armato, macula magna dorsali nigra lobata; lobis reccurvis florem expansum quodammodo simulante, cornubus dorsalibus foveave postica nullis. *Corpus* subtus totum atrum: femoribus quatuor posticis solummodo nigris.

Var. β.

Var. β. thorace femoribusque quatuor posticis supra, cupreo-auratis: macula thoracis dorsali minori; lobis vix recurvis.

This species is nearly related to *C. splendidulus* and *conspicillatus* Fabr. From the former it is distinguished not only by having the horn on the head flattened instead of compressed at its apex, but the thoracic horns are narrower and more elevated, and the fovea does not extend the whole length of the thorax: besides, in *C. splendidulus* the horn terminates near the anterior margin of the thorax in a prominent tooth, which is wanting in *C. floriger*. *C. conspicillatus* is also a native of Brasil; but the thorax of this is very retuse anteriorly, and armed with two teeth only, which is not the case with the insect I have described. The insects in question, with several other species, vary from *Copris* in their antennæ and some other characters, and form a connecting link between *Onitis* and that genus.

ONTHOPHAGUS Latr.

Greeni. 30. O. obscurus, clypeo emarginato transverse carinato, thorace punctatissimo: punctis papillatis, elytris scabris.

Long. corp. lin. 6.

Habitat apud Promontorium Bonæ Spei. D. Green.

Corpus atrum, obscurum, fere hemisphæricum. *Caput* rugulosum, antice emarginatum, postice linea transversa elevata. *Thorax* antice utrinque obsolete retusus, punctulis creberrimis confluentibus papillatis irroratus. *Elytra* granulis minutissimis, sine lente forti vix conspicuis, scabra, punctis etiam haud profundis notata. *Tibiæ* anticæ obtuse tridentatæ.

This insect seems to vary somewhat from the habit of *Onthophagus*, and forms an intermediate link between it and *Copris*.

macrocephalus. 31. O. niger, nitidus, thorace retuso, clypeo elongato: occipite lamina lata apice nutante.

Long. corp. lin. 7.

Habitat in Australasia.

Corpus nigrum, nitidum, subtus ferrugineo pubescens. *Clypeus* elongatus, acuminatus, supra concavus, postice transverse carinatus: *Occiput* lamina longa lata, isoscelem triangulum referente, recumbente, apice nutante. *Thorax* brevissimus, lateribus rotundato-obtusangulis, antice retusus, dorso obsolete canaliculatus. *Tibiæ* anticæ quadridentatæ.

Capella. 32. O. niger, thorace antice retuso bituberculato, clypeo punctato, occipite lamina lata bicorni.

Long. corp. lin. $6\frac{1}{2}$.

Habitat in Australasia.

Corpus nigrum, obscurum, subtus pubescens. *Caput* clypeo rotundato, punctato, postice transverse carinato. *Occiput* lamina transversa, elevata, arcuata, utrinque cornu brevi obtuso subincurvo armata. *Antennæ* piceæ: clava pallida. *Thorax* punctatus, dorso canaliculatus, antice retusus in medio bituberculatus. *Tibiæ* anticæ obtuse tridentatæ.

rugosus. 33. O. niger, rugosus, thorace tricorni: intermedio bilobo, clypeo emarginato.

Long. corp. lin. 5—6.

Habitat in Australasia. D. MacLeay.

Corpus nigrum, subtus pubescens. *Caput* rugoso-punctatissimum: occipite punctis sparsis. *Clypeus* antice attenuatus, apice subemarginatus, postice linea transversa elevata subundulata. *Vertex* transverse obsolete carinatus. *Thorax* antice retusus tricornis:

tricornis: cornubus lateralibus minutis dentiformibus, intermedio majori protenso bilobo: lobis divergentibus apice rotundatis, pone cornua rugosissimus. *Elytra* striata rugosissima: rugis dædaleis. *Tibiæ* anteriores reliquis longiores, arcuatæ, quadridentatæ: dentibus tribus primis prælongis, acutis.

Alter sexus minor, thorace quadridentato: dentibus æqualibus, tibiis anterioribus brevioribus.

SCARABÆUS Latreille.

Æneas. 34. S. thoracis cornu incurvo bifido: lobis acutis, capitis recurvo compresso simplici, elytris brevibus.

Long. corp. lin. 21.

Habitat in Brasilia. D. Hancock.

Corpus nigrum, subtus pubescens. *Caput* cornu elongato, compresso, arcuato, recurvo, simplici, acuto, punctato, basi ruguloso, armatum. *Clypeus* apice bidentatus: dentibus recurvis. *Mandibulæ* apice bidentatæ: dentibus elongatis. *Thorax* antice declivis, postice dorso valde gibbus et quasi in monticulum elevatus: gibbere cornu brevi horizontali protenso bifido: lobis acutis, armato. Latera thoracis rugosa. *Elytra* nigro-castanea, nitidissima, sparse levissime punctulata: latere punctis majoribus cinereis irrorata, stria, huic generi ordinaria, crispa apud suturam notanda. *Tibiæ* anticæ acute tridentatæ.

This species has considerable affinity with *Geotrupes bilobus* Fabr.; but the elytra are not striated, and the lobes of the thoracic horn are acute.

Ascanius. 35. S. thorace antice retuso mucronato, clypeo emarginato.

Long. corp. lin. 11.

Habitat in Brasilia. D. Hancock.

Corpus

Corpus fere rufo-castaneum nitidum. *Caput* e punctulis confluentibus rugulosum: linea elevata transversa in medio sinuata. *Clypeus* emarginatus. *Thorax* punctatus, fovea magna: fundo ruguloso, antice excavatus. Ante foveam in margine ipso cornu breve rectum obtusum. *Elytra* punctato-striata infra apicem gibba: gibbere brevissimo. *Tibiæ* anticæ acute tridentatæ. *Tarsi* antici unguiculo interno bifido.

This species appears to be related to *Geotrupes Zoilus* Fabr.; but it is of a different colour, and considerably larger than that insect as figured by Olivier.

MELOLONTHA Fabr.

aurulenta. 36. M. cupreo-aurata, subtus piloso-incana, thorace fovea dorsali fundo carinato, clypeo emarginato.

Long. corp. lin. 4.

Habitat in Australasia. D. MacLeay.

Affinis videtur *M. aulicolæ* Fabr. (*M. aulica* Oliv.) sed alia. *Corpus* oblongum, cupreo-auratum, subtus piloso-incanum. *Caput* subpilosum, confluenter punctulatum. *Clypeus* quadratus, reflexus, apice emarginatus, supra transverse carinatus. *Thorax* punctatus: punctis sparsis, utrinque impressus, lateribus obtusangulis vel subspinosis, fovea dorsali haud profunda longitudinaliter carinata postice impressus. *Elytra* excavato-punctatissima: lineis duabus longitudinalibus elevatis obsoletiusculis. *Tarsi* violacei. *Tibiæ* anticæ bidentatæ: dente apicis elongato.

Obs. An hujus generis?

GENIATES

GENIATES Kirby.

Labrum transversum, antice obtusangulum, subtus processu parvo inflexo munitum.

Labium transversum, latissimum, breve, medio acuminatum, basi palpigerum.

Mandibulæ subarcuatæ, corneæ, validæ, apice emarginatæ.

Maxillæ mandibuliformes, subarcuatæ, corneæ, validæ, apice tridentatæ.

Antennæ novem-articulatæ: clava triphylla, elongata, lineari-lanceolata, pilosa.

Pectus et *Postpectus* inermia.

Tarsi antici masculi articulis quatuor primis dilatatis subtus scopula pilorum dense pulvinatis.

Unguiculi posteriores externi apice bifidi, antici pollice basi instructi.

APOGONIA Kirby.

Labrum postice rotundatum, antice medio acuminatum.

Labium transversum, medio subacuminatum, basi palpigerum.

Mandibulæ subarcuatæ, corneæ, validissimæ, apice fornicatæ, subemarginatæ.

Maxillæ mandibuliformes, brevissimæ, corneæ, apice edentulæ subemarginatæ.

Palpi subclavati.

Antennæ decem-articulatæ: clava tryphylla, sublanceolata, pilosa.

Pectus et *Postpectus* inermia.

Unguiculi omnes apice bifidi.

ANOPLOGNATHUS Leach.

Labrum transversum, antice medio acuminatum.

Labium quadratum, medio acuminatum, sub apice palpigerum.

Mandibulæ

Mandibulæ breves, validissimæ, corneæ, apice edentulæ integerrimæ extus rotundatæ intus acutæ incurvæ.
Maxillæ mandibuliformes, arcuatæ, breves, validæ, corneæ, lobo edentulo fornicato, apice subemarginato.
Palpi subclavati.
Antennæ decem-articulatæ: clava triphylla, semiovata, pilosa.
Poststernum caput versus protensum, conicum.
Unguiculi omnes simplices.

I have given the characters of *Anoplognathus*, as well as of the two genera I have here established, that I might afford a clearer view of those particulars in which they differ, in order that the claim of the latter to be considered as distinct genera may be more readily perceived. In habit and external appearance they certainly appear very unlike each other; but their oral organs are upon the whole so similar, that from these they might perhaps be thought to belong to the same genus, and be well arranged under *Anoplognathus*. A near view of them, however, will I trust justify me for giving them as distinct.

In the first place, *Anoplognathus* is distinguished, besides its general habit which at first sight appears different, from both *Geniates* and *Apogonia* by the remarkable protended conical poststernum observable in all the species of that genus; in the next, by having all its claws simple and undivided; in this respect resembling *Rutela*. Its labium also is of a different shape, unless it may be regarded as connate with the mentum. From *Geniates* it differs in having maxillæ without teeth at the end and very concave, and, which is important, its antennæ have one more joint. Those remarkable circumstances, peculiar to the males of *Geniates*, of a stiffly-bearded mentum and dilated anterior tarsi, furnish also a striking distinction. From *Apogonia* it may be known

known not only by the particulars before noticed, but also by its transverse labrum, its entire and very concave maxillæ, and by the elytra covering all the joints of the upper side of the abdomen but the last; whereas in *Apogonia* the two last joints are uncovered. *Geniates* may be distinguished from *Apogonia* not only by this last circumstance, in which it agrees with *Anoplognathus*, but also by having a transverse labrum, maxillæ armed with three teeth, by the insertion of its head, which is inclined towards the horizon, whereas in *Apogonia* it is nearly vertical, by having a joint less in its antennæ, by the beard on its chin, and remarkable dilated anterior tarsi before noticed, by having only its exterior claw, and not both, bifid at the apex; and lastly, by the remarkable thumb-like process at the base of the inner anterior claw.

GENĪATES.

barbatus. 37. G. testaceus, capite postice nigro, mento masculo dense barbato, elytris striatis.

PLATE XXI. FIG. 8.

Long. corp. lin. $8\frac{1}{2}$.

Habitat in Brasilia. D. Hancock. *Fœmina* in Musæo D. MacLeay.

Statura fere *Melolonthæ melanocephalæ* Fabr. sed major. *Corpus* oblongum, testaceum, subtus parum pubescens. *Caput* declive, confluenter punctatum, postice nigrum. *Clypeus* transversus rugulosus, antice rotundatus: margine reflexo. *Oculi* magni, subglobosi. *Thorax* transversus, marginatus, levissime punctulatus, antice subretusus emarginatus, postice subrepandus: lateribus rotundatis. *Scutellum* triangulare, punctulatum. *Elytra* striata: striis subpunctatis; interstitiis alternis punctatis. *Tibiæ* anticæ tridentatæ. *Tarsi* quatuor posteriores unguiculis ex-

 ternis

ternis apice bifidis, antici dilatati subtus scopula densa rigida pulvillati, triunguiculati: ungue intermedio longiori bifido, interno brevi arcuato obtuso polliciformi.

Obs. Fœminæ mentum imberbe, tarsi antici vix dilatati.

Another insect in my cabinet, which I regard as *Melolontha ruficollis* Fabr., but which comes from Brazil, is distinguished by dilated anterior tarsi, and may perhaps belong to this genus. Its labrum, however, is triangular, with the vertical angle emarginate, and the acumen of the labium is also emarginate; in other respects its oral instruments agree with those of *Geniates*.

APOGONIA.

gemellata. 38. A.

PLATE XXI. FIG. 9.

Habitat in Brasilia?

Corpus oblongum, subcylindricum, excavato-punctatissimum, glabrum, nitidum, nigro-piceum. *Caput* deflexum et fere verticale: vertice summo horizontali. *Clypeus* declivis: margine rotundato reflexo. *Palpi* rufi. *Antennæ* rufæ. *Thorax* transversus, convexus, antice segmento circuli dempto, postice obsolete obtusangulus: lateribus marginatis rotundatis. *Scutellum* subtriangulare, apice læve. *Elytra* æneo-picea, excavato-punctata: seriebus quatuor punctorum per paria ordinatis, latere exteriori subsulcata: sulcis punctatis. *Tibiæ* anticæ bidentatæ. *Tarsi* unguiculis æqualibus, bifidis.

The species here described agrees in many respects with Fabricius's description of *Melolontha geminata*; but the term "caput læve" at once indicates their difference, since in my insect the head as well as the thorax is thickly covered with deeply-impressed points.

ANO-

ANOPLOGNATHUS Leach.

rugosus. 39. A. elytris rufis rugosis, capite thoraceque fulvo-viridi-auratis.

Long. corp. lin. 11.

Habitat in Australasia.

Corpus nigrum nitidum, subtus pube albida. *Caput* declive fulvum: splendore viridi-aureo, punctulatum antice confluenter. *Clypeus* distinctus: linea elevata transversa obtusangula. *Thorax* supra leviter punctulatus, colore capitis, postice in medio subemarginatus. *Scutellum* viridi-auratum triangulare, basi depressum. *Elytra* rufa, non aurata, ex punctis impressis irregularibus rugosa. *Poststernum* viride, nitidum, porrectum, acutissimum: linea, basi tripartita, impressa. *Pedes* testacei, subaurati: tarsis nigris. *Tibiæ* anticæ tridentatæ. *Abdomen* nigrum, glabriusculum, supra viridi-æneum: ano subtus testaceo.

inustus. 40. A. supra luridus, elytris lineolis punctisque inustis nigris.

Long. corp. lin. 11.

Habitat in Australasia.

Corpus subtus nigrum, pube alba decumbente incanum, supra luridum, nitidum. *Thorax* utrinque puncto majori impresso. *Elytra* punctata: dorso insuper lineolis punctisque nigris inustis notato. *Sternum* acutum, porrectum, testaceum. *Pedes* testacei subaurati: tarsis splendore viridi. *Tibiæ* anticæ tridentatæ. *Abdomen* nigro-cupreum.

RUTELA Latr.

pulchella. 41. R. viridi-lutea, thoracis dorso, scutello, elytrisque fascia lunari, viridibus.

PLATE XXI. FIG. 10.

Long. corp. lin. $8\frac{1}{2}$.

Habitat in Brasilia. D. Hancock.

Corpus luteo-testaceum, nitidum: flavedine viridi tincta. *Caput* punctatum, viride: clypeo antice luteo. *Labrum* subtriangulare, sub clypeo latitans inflexum. *Labium* minutum transversum. *Palpi maxillares* clavati: articulo extimo majori, ovato-lanceolato. *Labiales* filiformes. *Mandibulæ* apice bidentatæ: dentibus rotundatis. *Clypeus* antice truncatus, emarginatus. *Thorax* medio latior, utrinque subangulatus, viridis, punctulatus: lateribus luteis. *Scutellum* triangulare, viride. *Coleoptra* obsolete punctato-striata, luteo-testacea: basi apud scutellum, fasciaque lunari pone medium, viridia. *Tibiæ* validæ, anticæ acute tridentatæ: tarsis nigris: unguiculis simplicibus.

liturella. 42. R. viridi-lutea, supra viridis, thorace lateribus linea dorsali elytrisque vittis duabus luteis.

Long. corp. lin. $5\frac{3}{4}$.

Habitat in Brasilia. D. Hancock.

Corpus luteum, viridi micans, subtus utrinque rugulosum. *Caput* punctatum viride: ore luteo. *Clypeus* antice truncatus emarginatus. *Labium* emarginatum. *Thorax* punctatissimus, viridis: lateribus obtusangulis lineolaque dorsali postice abbreviata, luteis. *Scutellum* longitudine latius, viride, breve. *Elytra* striata: striis lævibus; interioribus antice abbreviatis, viridia: vittis duabus, antice latioribus connexis, luteis. *Tibiæ posticæ* supra virides subtus cupreæ: anterioribus quatuor margine externo viridi, *anticæ* acute tridentatæ. *Tarsi* rufo-picei.

cyanipes. 43. R. oblonga, aurato-viridis, pedibus cyaneis.

Long. corp. lin. 17.

Habitat

Habitat in Brasilia. D. Hancock.

Affinis *Cetoniæ ignitæ* Oliv. sed diversa. *Corpus* oblongum, totum aurato-viride, subtus pubescens. *Caput* punctulatum. *Clypeus* margine reflexo. *Antennæ* clava elongata, viridi: caule fusco. *Thorax* punctatus: lateribus rugosis. *Elytra* punctata: punctis impressis subseriatim ordinatis: serierum interstitiis punctulatis, lateribus rugosis. *Pedes* cyanei: tibiis anticis tridentatis. *Abdomen* ex lineolis impressis supra rugulosum, podice inflexo.

GOLIATHUS Lamarck.

fasciatus. 44. G. fuscus albido irroratus, thorace viridescenti, elytris fascia obliqua nigra, clypei cornubus emarginatis.

Long. corp. lin. 15¾.

Habitat in Brasilia. D. Hancock.

Corpus subtus nigrum, pubescens, supra totum varium punctis maculisque pollinoso-albis. *Clypeus* bilobus: lobis corniformibus compressis elevatis, apice emarginatis. *Antennæ* testaceæ. *Thorax* fusco-viridis, inæqualis: margine laterali rotundato, dentato, dorso obsolete canaliculatus. *Elytra* fusca, polline albido variegata: fascia nigra obliqua angulata, ante apicem gibba. *Tibiæ anticæ* acute tridentatæ. *Alt. sexus* clypeo quadrato, rugoso: margine recurvo, quinquedentato.

inscriptus. 45. G. fuscus albido irroratus, thorace viridescenti, elytris litera *n* reversa nivea inscriptis, clypei cornubus apice rotundatis.

Long. corp. lin. 12.

Habitat in Brasilia. D. Hancock.

Simillimus præcedenti, sed minor. *Clypeus* cornubus apice rotundatis.

datis. *Elytra* punctis et maculis pollinoso-subcinereis obscurioribus. In utroque elytro litera *n* reversa alba conspicienda.

TRICHIUS Fabr.

Triangulum. 46. T. ater, thorace triangulo impresso, elytris lunula lituraque furcata, fulvis, podice utrinque albo.

Long. corp. lin. 4.

Habitat in Brasilia. D. Hancock.

Affinis *T. Delta*, tamen omnino distinctus. *Corpus* nigrum, subtus rugulosum. *Caput* rugulosum: clypeo elongato, emarginato. *Antennæ* brunneæ: clava dilutiori. *Thorax* glaber, sparse punctatus, et inter hæc puncta minutissime rugulosus, dorso triangulo obverso impressus. *Elytra* inæqualia: lituris duabus arcuatis; posteriori apicem versus elongata furcata, unde literæ Græcorum γ reversa quodammodo similis, fulvis, lineola insuper transversa laterali alba. *Postpectus* utrinque punctis tribus pollinoso-albis. *Pedes* brunnei. *Tibiæ* anticæ acute tridentatæ. *Podex* utrinque pollinoso-albus.

CETONIA Fabr.

Macleaii. 47. C. nitidissima, aurato-viridis, thoracis disco, coleoptris maculis duabus quadratis, fasciaque communi lunata, atris.

PLATE XXI. FIG. 11.

Long. corp. lin. $10\frac{1}{2}$.

Habitat in Insula Luconia prope Manillam. D. Davidson.

Insectum splendidissimum pulcherrimum. Statura et habitus fere *C. africanæ*, &c. *Corpus* depressum, lævigatum, glaberrimum, nitidissimum, aurato-viride, fere smaragdinum. *Caput* basi

basi nigrum, punctatum, inter oculos postice læve. *Vertex* cornu brevi decumbenti apice obtuso armatus. *Clypeus* margine reflexo, apice bidentatus: dentibus rotundatis. *Antennæ* nigræ: clava semiovali picea. *Palpi* picei. *Thorax* triangularis, apice subtruncatus, utrinque antice canaliculatus, postice medio emarginatus: disco macula magna subtriangulari antice angulata, atra. *Scutellum* elongato-triangulare basi paulo dilatatum. *Coleoptra* supra planiuscula, lateribus deflexis: macula magna quadrata utrinque apud scutellum fasciaque apicis lunari communi, atris. Elytrorum apex apud suturam mucronatus. *Poststernum* porrectum, canaliculatum, apice auctum incurvum. Thoracis latera deflexa et femora lineolis nigris obliquis insculpta. *Tibiæ tarsique* castanea. *Tibiæ anticæ* edentulæ. *Abdomen* segmentis apice nigris.

Viro amicissimo, naturæ scrutatori docto indefesso, in Entomologiâ eximio, et insectorum musæi ditissimi, ex omni fere orbis terrarum regione collectorum digno possessori, Domino Alexandro MacLeaio S. R. et L. S. Soc. Linn. a Secret. *hoc pulcherrimum insectum ab ipso mihi benevole communicatum merito dicatur.*

This beautiful insect was brought from Manilla by Mr. Simon Davidson, Surgeon in the Royal Navy, who purchased several of them in a shop, where its elytra and those of some splendid *Buprestes* were sold as ornaments for ladies' head-dresses.

insculpta. 48. C. thorace lobato, livida, tota lunulis nigris insculpta, elytris macula apicis lunata nigra.

Long. corp. lin. 9.

Habitat in Brasilia. D. Hancock.

Corpus subtus glaucum, supra lividum, totum lineolis plus minus arcuatis, interdum confertis, in prona pagina sæpius brevissime setigeris,

setigeris, insculptis, atris irroratum. *Clypeus* apice reflexus emarginatus. *Antennæ* brunneæ: clava caulis fere longitudine. *Thorax* triangularis, antice emarginatus, pone oculos utrinque paulo excisus, ciliatus, postice lobatus: lobo apice rotundato. *Scutellum* minutum, triangulare, niveum. *Elytra* dorso planiuscula, inæqualia: macula sublunata atra pone apicem. *Tibiæ* anticæ edentulæ.

reticulata. 49. C. thorace lobato, subpilosa nigra, fulvo maculata, elytris obsolete reticulatis, oculorum septo bicarinato.

Long. corp. lin. 6.

Habitat in Brasilia. D. Hancock.

Affinis videtur *C. maculosæ* Oliv. sed distincta et alia. *Corpus* nigrum, subpilosum. *Caput* pallidum, punctis impressis nigris irroratum. *Clypeus* apice transversus. *Antennæ* nigræ. *Oculi* septo bicarinato. *Thoraæ* punctis impressis, sæpius nigris, irroratus, nigricans: lituris duabus obscuris sordide luteis: lobo posteriori apice rotundato. *Elytra* velutino-nigra: maculis sparsis obscuris sordide fulvis: lineolis tenuissimis transversis, arcuatis, elevatis obscure reticulata. *Pedes* hirti, nigri, immaculati. *Tibiæ* anticæ acute bidentatæ. *Postpectus* utrinque macula lutea. *Abdomen* luteo utrinque variegatum. *Podex* utrinque macula lutea.

(*Lucanidæ.*)

LUCANUS Linn.

nebulosus. 50. L. niger, obscurus, mandibulis recurvis thorace canaliculato inæquali, elytris fuscis cinereo-nebulosis.

PLATE

PLATE XXI. FIG. 12.

Long. corp. mandibulis exclusis, lin. 10.
——————— mandibularum, lin. $2\frac{3}{4}$.

Habitat in Australasia. D. MacLeay.

Corpus oblongum, depressum, subtus nigrum nitidum punctatum, supra valde obscurum. *Caput* transversum, punctatum, subcarinatum, postice cinereum, antice obtusangulum elevatum utrinque tuberculo intermedio munitum. *Mandibulæ* thorace breviores, intus rectiusculæ hirsutæ punctatæ, apice recurvæ emarginatæ, utrinque dente magno prominentes, supra dente obtuso armatæ, subtus etiam dentibus tribus parvis obtusis interioribus. *Labrum* penitus tectum. *Palpi* articulis arcuatis. *Mentum* bifidum. *Antennæ* thorace breviores, fractæ, clavatæ: clava compressa pectinata quinquefida. *Thorax* transversus, punctatus, nigricans, dorso late canaliculatus, utrinque insuper foveis quatuor impressis, antice emarginatus, postice repandus: lateribus deflexis obtusangulis. *Scutellum* triangulare. *Elytra* lævissima, valde obscura, purpurascente-fusco cinereoque nebulosa. *Femora antica* lata, oblonga. *Tibiæ anticæ* multidentatæ. *Abdomen* fuscum.

This species differs from the other *Lucani* in having a bifid mentum, recurved mandibulæ (in which it agrees with *Lamprima* Latr.), and palpi with curved articulations; but its broken antennæ with a pectinated clava, and depressed body, prove that it is more nearly related to *Lucanus* than to *Lamprima*, in which the body is more convex, the antennæ unbroken with a lamellated clava. It seems scarcely entitled to be considered as distinct from *Lucanus*; but at any rate it forms a family in that genus.

COLEOPTERA HETEROMERA.

(*Tenebrionidæ.*)

PSAMMODES Kirby.

Labrum emarginatum.
Labium bifidum: lobis divaricatis.
Mandibulæ apice conniventes, bidentatæ.
Maxillæ basi apertæ.
Palpi filiformes, *maxillares* elongatæ.
Mentum trapeziforme.
Antennæ graciles, subclavatæ: clava triarticulata.
Corpus oblongo-ovatum.

This genus is intermediate between *Pimelia* and *Tentyria:* from the former it is distinguished by its bifid labium, by its quadrangular mentum, narrowest below so as not to cover the base of the maxillæ, and by its long, slender, clavate antennæ; and from the latter, besides these characters, by its emarginate labrum. It is to be observed, that in this latter organ *Pimelia muricata* and *hispida* differ from each other, as well as in their antennæ, and the form of their bodies; hence the genus might be divided into two families, * *Corpore subgloboso*, ** *Corpore oblongo.*

longicornis. 51. Ps. niger, cinereo-setosus, antennis elongatis, elytris granulatis scabris.

PLATE XXI. FIG. 13.

Long. corp. lin. 10.

Habitat apud Promontorium Bonæ Spei. D. Green.

Pimeliæ brunneæ et *lævigatæ* Oliv. congener et affinis: ab ambabus differt antennis longioribus, a priori colore nigro et capite postice, nec antice, punctato, et a posteriori thorace excavato-

punctato

punctato nec leviter, et elytris granulato-scabris et haud lævigatis. *Corpus* oblongo-ovatum vel ovato-lanceolatum, supra ex pilis rigidiusculis subincanum, subtus disco piloso-ferrugineum. *Caput* triangulare, postice punctatissimum: clypeo depresso, emarginato, punctis sparsis; labro lævi. *Palpi* filiformes, ferruginei. *Maxillares* quadriarticulati: articulo primo brevissimo, secundo majori clavato, tertio obconico, extimo oblongo apice rotundato. *Antennæ* thorace longiores, graciles, ferrugineæ, pilosæ: articulo primo crasso, subcampanulato, secundo brevissimo, tertio longissimo subclavato, sequentibus quinque longitudine sensim decrescentibus subclavatis, tribus ultimis majoribus clavam formantibus: nono obconico, decimo turbinato, extimo ovato. *Thorax* convexus confluenter punctulatus, antice emarginatus, postice transversus, in medio latior, lateribus tenuissime marginatus, dorso subcarinatus: carina lævi. *Scutellum* subacuminatum, basi latissimum. *Coleoptra* obovata, connata, marginata: margine subexplanato, granulato-scabra: granulis piligeris. *Epipleura* linearis, acuta. *Pedes* graciles, *postici* elongati. *Tibiæ* apice bicalcaratæ. *Tarsi* filiformes: unguiculis longis, gracilibus, simplicibus.

OXURA Kirby.

Labrum subquadratum, subemarginatum.
Labium bifidum: lobis divaricatis.
Mandibulæ breves, apice bidentatæ.
Maxillæ basi apertæ.
Palpi maxillares elongati: articulo extimo magno, securiformi,
labiales filiformes.
Mentum fere trapeziforme.
Antennæ medio attenuatæ, subclavatæ: clava triarticulata.
Corpus lineare.

Caput rhomboidale: oculis prominulis triangularibus.
Thorax teretiusculus, vix marginatus.

The characters which distinguish *Oxura* from *Psammodes*, which it much resembles, are principally the last joint of the maxillary palpi, which is securiform, its linear body, its rhomboidal head contracted almost into a neck behind the eyes, its prominent triangular eyes, its barrel-shaped thorax with scarcely any margin, and its elytra furnished with a mucro at their apex like those of a *Blaps*.

setosa. 52. O.

PLATE XXII. FIG. 3.

Long. corp. lin. $8\frac{1}{4}$.

Habitat apud Promontorium Bonæ Spei. D. Green.

Corpus lineare, angustum, fusco-nigrum, ex setis rigidis subcinereum. *Caput* subrhomboidale, postice fere in collum angustatum, punctatum: punctis setigeris. *Palpi* rufi, *maxillares* elongati, quadriarticulati: articulo primo brevissimo, secundo elongato clavato, tertio triangulari, extimo magno securiformi, *labiales* triarticulati, filiformes. *Antennæ* ante oculos sub clypei margine laterali insertæ, rufæ, clavatæ, medio attenuatæ: articulo primo incrassato subcampanulato, secundo brevissimo turbinato, tertio filiformi sequentibus duobus simul sumptis longiori, proximis quinque subclavatis, longitudine et crassitie sensim decrescentibus, tribus ultimis majoribus clavam oblongam formantibus: nono obconico, decimo turbinato, extimo ovato. *Oculi* prominentes, triangulares. *Thorax* immarginatus, teretiusculus, medio latior vel fere doliiformis, antice subconstrictus, punctatissimus: punctis cinereis setigeris. *Elytra* linearia, lævia: lineis duabus longitudinalibus intermediis elevatiusculis, marginata: margine explanato recurvo, apice mucronata. *Epipleura* linearis. *Pedes* fere ut in *Psammode* longicorni.

SCOTĪNUS

SCOTĪNUS Kirby.

Labrum bifidum.
Labium bifidum: lobis divaricatis.
Mandibulæ apice conniventes, dentatæ.
Maxillæ basi apertæ.
Palpi crassiusculi: articulo extimo majori obtriangulari.
Mentum bifidum: lobis divaricatis.
Antennæ moniliformes, apicem versus subcrassiores: articulo extimo brevissimo vix distincto.
Corpus ovatum, marginatum.

This genus resembles *Erodius* and *Asida* in the last joint of the antennæ, but it differs from them both in the labrum, labium, and mentum. With *Erodius* it has a bifid sternum; its clypeus, however, is not bifid, in which it agrees with *Asida*, but the sternum of the latter genus is entire.

crenicollis. 53. Sc. subcinerea obscura, thoracis margine crenato.

PLATE XXI. FIG. 14.

Long. corp. lin. $9\frac{1}{4}$.

Habitat in Brasilia. D. Hancock.

Corpus obovatum, obscurum, nigrum, ex setulis squamulisve quibusdam brevissimis subcinereum, lævissimum, supra planiusculum. *Caput* deflexum, inæquale, inter oculos postice transverse elevatum. *Clypeus* antice emarginatus, apice in medio triangulo nitido. *Labrum* magnum, nitidum, vix longitudine latius, piceum, excavato-punctatum, apice bifidum: lobis rotundatis. *Labium* breve, nitidum, excavato-punctatum, piceum, apice bifidum: lobis divaricatis. *Palpi* breves crassi: articulo extimo majori obtriangulari. *Mentum* basi constrictum, apice latissimum,

latissimum, bilobum: lobis divaricatis. *Antennæ* capite paulo longiores, setosæ, piceæ, apicem versus paulo crassiores, moniliformes: articulo primo reliquis paulo crassiori clavato, secundo brevissimo subgloboso, tertio reliquis longiori subclavato, sequentibus sex subglobosis, decimo brevissimo transverso undecimum minutissimum recipiente, ita arcte ut hi duo quasi unum articulum subglobosum formant. Articuli 7, 8, 9 nitidi, reliqui obscuri. *Thorax* quadratus, antice paulo latior et emarginatus, postice rotundatus et utrinque angulatus: lateribus marginatis; margine crenato, linea dorsali postica piloso-fulva signatus. *Sternum* anum versus bilobum: lobis rotundatis. *Scutellum* minutum, acuminatum, basi latissimum. *Coleoptra* obovata, connata, acute marginata, apice declivia mucronata rufescentia, apud scutellum macula parva quadrata velutino-nigra. *Epipleura* maxima. *Pedes* setosi. *Tibiæ* apice bicalcaratæ.

Mr. MacLeay possesses a smaller species of this genus, also from Brasil, distinguished from *S. crenicollis* by having the margin of the thorax entire, and that of the elytra crenate.

SPHÆROTUS Kirby.

Labrum transversum, apice rotundatum ciliatum.
Labium minutum, apice truncatum.
Mandibulæ vix dentatæ.
Maxillæ basi apertæ.
Palpi maxillares incrassati: articulo extimo maximo, securiformi.
labiales articulo extimo paulo majori, subcampanulato.
Mentum apice truncatum, basi rotundatum, medio valde convexum.
Antennæ extrorsum subcrassiores: articulo extimo oblique truncato.
Corpus globoso-ovatum, immarginatum.

This

This genus in habit much resembles *Moluris* Latr.; but the bifid labium, cordate mentum, subfiliform palpi, and antennæ terminated by an ovate acute joint, which distinguish the latter, sufficiently warrant me in considering them as distinct.

curvipes. 54. S.

PLATE XXI. FIG. 15.

Long. corp. lin. $5\frac{1}{2}$.

Habitat in Brasilia. D. Hancock.

Corpus globoso-ovatum, glaberrimum, nitidiusculum, nigro-æneum. *Caput* orbiculatum, levissime punctulatum. *Clypeus* subtriangularis, a fronte sutura profunda separatus. *Antennæ* apicem versus paulo crassiores: articulo primo brevi obconico sequentibus vix crassiori, secundo brevissimo subgloboso, tertio sequentibus paulo longiori subclavato, reliquis longitudine sensim decrescentibus plus minus obconicis: extimo oblique truncato. *Thorax* convexus, levissime punctulatus, antice subemarginatus, postice transversus subemarginatus, lateribus rotundatis tenuissime marginatis. *Scutellum* minutissimum. *Coleoptra* subglobosa, seriatim quasi variolosa: variolis obscuris canaliculatis. *Epipleura* latiuscula. *Pedes* piceo-nigri. *Tibiæ* graciles, arcuatæ: calcaribus duobus minutissimis obsoletis. *Tarsi* pulvillati.

STRONGYLIUM Kirby.

Labrum transversum.

Labium subcordatum.

Mandibulæ brevissimæ, validæ, apice edentulæ acutæ.

Maxillæ apertæ, apice bilobæ: lobo exteriori majori extus rotundato, interiori minuto acuto.

Palpi articulo extimo magno securiformi.

Mentum

Mentum fere cordatum.
Antennæ apicem versus sensim crassiores: articulo extimo subovato.
Corpus lineari-oblongum, immarginatum.

This genus in many respects resembles the preceding. But the labium, mentum, and labial palpi are different: the body also is oblong, the thorax has no margin, and the tarsi no pulvillus; circumstances which combined satisfactorily establish their claim to be considered as distinct genera.

chalconatum. 55. Str.

PLATE XXI. FIG. 16.

Long. corp. lin. 6.

Habitat in Australasia.
Corpus lineari-oblongum, subcylindricum, nitidum, glabrum, nigro-æneum. *Caput* orbiculatum, punctulatum. *Palpi* omnes articulo extimo majori securiformi. *Clypeus* postice linea curva impressa a fronte separatus. *Antennæ* thoracis longitudine, apicem versus sensim crassiores: articulo primo reliquis crassiori, secundo brevissimo obconico, sequentibus duobus longitudine fere æqualibus subclavatis, sex proximis magnitudine crescentibus longitudine decrescentibus fere obconicis, extimo ovato acuto. *Thorax* subquadratus, immarginatus, levissime punctulatus, postice canaliculatus. *Scutellum* triangulare. *Elytra* subseriatim quasi foveolata: foveolis oblongis excavatis fundo canaliculatis. *Epipleura* angustissima. *Pedes* graciles. *Tibiæ* obsolete calcaratæ.

EURYNOTUS Kirby.

Labrum transversum, emarginatum.
Labium fissum, brevissimum, submembranaceum.

Mandibulæ

Mandibulæ validæ, conniventes, apice bidentatæ.
Maxillæ basi apertæ.
Palpi articulo extimo majori securiformi.
Mentum quadrangulum: lateribus rotundatis, subcarinatum.
Antennæ extrorsum crassiores: articulo extimo orbiculato.
Corpus oblongum, apterum.
Tarsi anteriores quatuor dilatati, pulvillati.

Eurynotus is distinguished from *Pedinus* Latr., to which it is nearly allied, in having a much larger and more conspicuous *labrum*, and a *clypeus* though emarginate not cleft. The four anterior *tarsi* of the males, and not the first pair only, are dilated. The thorax also is widest behind, whereas in *Pedinus* it is widest in the middle.

muricatus. 56. E.

PLATE XXII. FIG. 1.

Long. corp. lin. $7\frac{1}{3}$.

Habitat——Unde accepi non reminiscor.

Corpus oblongum, atrum, glabrum. *Caput* suborbiculatum, levissime punctulatum. *Gula* rugosa postice triangulo lævi. *Clypeus* transversus, antice emarginatus, a fronte linea impressa separatus. *Antennæ* vix thoracis longitudine, sensim crassiores: articulo primo reliquis crassiori, secundo brevissimo turbinato, tertio elongato subclavato, quatuor sequentibus obconicis sensim crassioribus, 8^0, 9^0, et 10^0 compressis triangularibus, extimo compresso orbiculato. *Thorax* transversus, leviter punctulatissimus, antice angustior segmento circuli dempto, postice subrepandus, lateribus marginatis. *Scutellum* transversum, brevissimum. *Elytra* connata, striata: striis punctatis, apice punctis elevatis acutis muricata. *Femora* postica arcuata, intus ciliata.

ata. *Tibiæ* bicalcaratæ. *Tarsi* quatuor anteriores articulis intermediis dilatatis subtus pulvinatis.

ADELIUM Kirby.

Labrum subquadratum, subemarginatum.
Labium bifidum.
Mandibulæ breves, apice conniventes bidentatæ.
Maxillæ basi apertæ.
Palpi maxillares articulo extimo maximo obtriangulari subcompresso.
labiales brevissimi, filiformes.
Mentum subtrapeziforme, inæquale.
Antennæ filiformes: articulo extimo oblongo.
Thorax brevissimus.
Corpus oblongum, apterum.

This genus has little affinity with any other of this tribe: the species of it, unless closely examined, would be set aside as belonging to *Calosoma* or *Carabus*. They are however heteromerous, and belong to the *Tenebrionidæ*. I know only three species, the two here described, and the other *Calosoma porculatum* of Fabricius. They are all New Holland insects.

calosomoides. 57. A. nigro-æneum, nitidiusculum, thorace utrinque impresso, elytris punctato-striatis.

PLATE XXII. FIG. 2.

Long. corp. lin. 6.

Habitat in Australasia.

Corpus nigro-æneum, nitidiusculum, glabrum. *Caput* orbiculatum, punctatum. *Clypeus* apice truncatus, postice linea impressa curva a fronte separatus. *Antennæ* filiformes, thorace longiores, pilosæ, nigræ: articulo primo reliquis paulo crassiore,

siore, secundo brevissimo subturbinato, tertio sequenti duplo longiori subclavato, proximis tribus oblongis 7°, 8°, 9°, et 10° obconicis, extimo oblongo. *Thorax* planiusculus, punctatus, longitudine latior, antice emarginatus, postice truncatus, lateribus fere in segmentum circuli rotundatis, marginatis, dorso obsolete canaliculatus, utrinque foveola lunata impressus. *Scutellum* minutum, triangulare. *Coleoptra* obovata, leviter punctulato-striata, apice acuta. *Epipleura* basi latiuscula, apice acutissima. *Tibiæ* apice brevissime bicalcaratæ. *Tarsi* pulvinati.

licinoides. 58. A. æneo-nigrum nitidum thorace utrinque impresso, elytris substriatis punctatis, tarsis rufis.

Long. corp. lin. 6.

Habitat in Australasia. D. Francillon.

Præcedenti valde affine, sed angustius, supra nigrius: *thorace* magis quadrato, supra inæquali: lateribus postice subexcisis. *Elytra* substriata: striis punctatis: punctis magis excavatis, apice minus acuta. *Femora* antica paulo crassiora. *Tarsi* omnes rufi.

(*Helopidæ.*)

SPHENISCUS Kirby.

Labrum transversum, integrum.

Labium minutum, cuneiforme.

Mandibulæ apice conniventes.

Maxillæ basi apertæ.

Palpi omnes articulo extimo magno, minus compresso, obtriangulari.

Mentum oblongum, convexum, apice subemarginatum.

Antennæ extrorsum crassiores, serratæ: articulo extimo subrhomboidali oblique truncato.

Corpus ovato-obcuneiforme: *elytris* gibbosis.

The habit of this genus is at first sight very much that of one of the gibbous *Erotyli*; but it is heteromerous, and belongs to the present tribe, and, with many others equally distinct, may have been arranged under *Helops*. It however possesses very few characters in common with the genuine species of that genus, *H. chalybeus*, &c., differing in antennæ, labium, mentum, palpi, and general habit.

erotyloides. 59. Sph.

PLATE XXII. FIG. 4.

Long. corp. lin. 8.

Habitat in Brasilia. D. Hancock.

Corpus fere obcuneiforme, subtus planiusculum, nitidum, glaberrimum, aterrimum, orbiculatum, punctatum, inter oculos canaliculatum. *Mentum* transverse subcarinatum. *Clypeus* depressus, antice subrotundatus, postice linea curva impressa a fronte separatus. *Antennæ* thoracis longitudine, sensim crassiores, apice compressæ, serratæ: articulo primo sequente paulo crassiori, secundo brevissimo subcylindrico, tertio sequentibus longiori cylindrico, quarto majori subtriangulari, sequentibus sex magnitudine crescentibus, triangularibus, extimo subrhomboidali. *Thorax* planiusculus, subtrapeziformis, antice segmento circuli dempto, inæqualis, sparse punctulatus, immarginatus, postice trifoveatus. *Scutellum* triangulare. *Coleoptra* subovata: dorso valde gibbo, seriatim punctata, tenuissime marginata, pallida: fascia media angulata, apicibus, punctisque plurimis sparsis interdum confluentibus, atris. *Pedes* longi, graciles. *Tibiæ* brevissime bicalcaratæ. *Tarsi* compressi, longius unguiculati: unguiculis basi intus dente obsoleto.

STENOCHIA Kirby.

Labrum transversum, apice rotundatum.
Labium minutum, cuneiforme.
Mandibulæ apice conniventes.
Maxillæ basi apertæ.
Palpi omnes articulo extimo minus compresso, obtriangulari.
Mentum subtrapeziforme, disco subelevatum.
Antennæ extrorsum crassiores: articulo extimo oblongo.
Corpus lineare, angustum.

This genus possesses many characters in common with the preceding; but it is sufficiently distinguished by its antennæ, which are not at all serrate, by its linear body, and cylindrical thorax. I possess two species distinguished by the same character.

rufipes. 60. St. virescens, supra cyanea, elytris fasciis duabus luteis margine connexis, antennis pedibusque rufis.

PLATE XXII. FIG. 5.

Long. corp. lin. 8.

Habitat in Brasilia. D. Hancock.

Corpus lineare, angustum, subtus virescens, ex pilis brevissimis micantibus sericeum. *Caput* postice confluenter punctatum cæruleum, antice pilis aureo micantibus ornatum. *Clypeus* antice transversus, postice rotundatus, linea curva impressa a fronte separatus. *Palpi* rufi. *Antennæ* extrorsum crassiores, thorace longiores, rufæ: articulo primo sequentibus crassiori obconico, secundo brevissimo, tertio vix quarto longiori, sed paulo tenuiori, ambobus clavatis, sequentibus obconicis et subturbinatis subcompressis, extimo oblongo-ovato obtuso. *Thorax* cylindricus, postice submarginatus, confluenter punctatissimus,

simus, virescenti-cyaneus. *Elytra* cyanea: basi et medio fascia sublunata margine laterali connexa pallide lutea, sulcata: sulcis lineis transversis elevatis decussatis. *Pedes* graciles, rufi: intermediis longioribus. *Tibiæ* apice vix calcaratæ. *Tarsi* unguiculis simplicibus basi intus subdentatis.

cyanipes. 61. St. cyanea, antennis rufis, thorace brevissimo, elytris fasciis duabus fulvis margine connexis.

Long. corp. lin. 6.

Habitat in Brasilia. D. Hancock.

Præcedenti affinis sed minor, corpore toto glaberrimo, cyaneo, postpectore solummodo et pedibus viridi-cyaneis. *Thorax* brevissimus, punctatus: punctis vix confluentibus. *Antennæ* articulo extimo magis oblongo. *Elytra* striata: striis punctatis, transverse rugosis: fasciis fulvis, anteriori suturam haud attingente, postica vix lunata.

I possess the mutilated remains of a third species without head or thorax, the legs of which are dirty-red, the elytra violet, and the fascia of the base of *St. rufipes* replaced by a large acute ovate pallid spot with the point towards the apex; the middle fascia does not reach the suture. In sculpture they resemble those of *St. cyanipes*; the abdomen and postpectus are green and hairy, but the hairs are not shining as in *St. rufipes*.

(*Mordellidæ.*)

MORDELLA Linn.

clavicornis. 62. M. atra, elytris lunula apicis cinerea, antennis clavatis: clava compressa serrata.

Long. corp. lin. $6\frac{1}{4}$.

Habitat in Brasilia. D. Hancock.

Corpus

Corpus crassum, totum velutino-atrum. *Antennæ* clava magna, compressa, serrata, septemfida: articulo extimo hinc subemarginato. *Elytra* ante apicem lunula reversa, obscura, cinerea. *Anus* aculeo ordinario.

This species in every respect so entirely resembles the other *Mordellæ*, under which genus I only place those *ano aculeato*, that I do not conceive the difference of structure observable in its antennæ, which may perhaps be a sexual character, a sufficient indication that it should form a distinct genus.

(*Meloidæ.*)

GNATHIUM Kirby.

Labrum transversum.
Labium minutissimum vix discernendum.
Mandibulæ protensæ, elongatæ, apice incurvæ, edentulæ, acutissimæ.
Maxillæ apertæ: lobo longissimo gracillimo.
Palpi filiformes: articulis cylindricis.
Mentum trapeziforme?
Antennæ extrorsum crassiores: articulo extimo elongato-conico.
Corpus obcuneato-lineare.
Thorax campanulatus.

This genus comes next to *Nemognatha* Illig., from which it borrows that remarkable sexual? character, of having the lobe of the maxillæ, like those of a bee, almost as long as the body; but it differs in having a transverse instead of a circular labrum, in its mandibulæ protended far beyond the labrum, in its incrassate antennæ, which gives it some connexion with *Mylabris*. The shape of the head and thorax also is different. The insect is so minute that I have not been able to get a clear idea of the shape of the *labium* and *mentum*, but I think the latter is trapeziform.

Fran-

Francilloni. 63. Gn.

PLATE XXII. FIG. 6.

Long. corp. lin. 2¾.

Habitat in Georgia. Ex Mus. D. Francilloni a D. MacLeaio emptum et mihi benevole communicatum.

Corpus obcuneatum fere, pilosulum, supra nigrum, subtus piceum. *Caput* deflexum, elongatum, punctatum: disco lævisculo, collo brevi angusto piceo insidens. *Mandibulæ* capite vix breviores, protensæ, apice incurvæ, rufæ. *Antennæ* apicem versus sensim crassiores, articulo secundo quarti fere longitudine, tertio reliquis longiori, sequentibus fere obconicis, 8⁰, 9⁰, 10⁰ subcylindricis, extimo elongato-conico. *Thorax* campanulatus, glaber, rufus, brevissimus. *Elytra* rugulosa. *Tibiæ* bicalcaratæ. *Tarsi* unguiculati: unguiculis bipartitis.

Memoriæ D^ni^ Francilloni, S.L.S. *heu nimis deflendi, Musæi longe et late celebris benevoli possessoris, hoc insectum sacrum esto.*

COLEOPTERA TETRAMERA.

(*Curculionidæ.*)

* *Infracticornes.*

RHINOTIA Kirby.

Labrum rostro postice connatum, minutissimum, emarginatum.
Labium minutissimum, cuneiforme.
Mandibulæ validæ: apice tridentatæ.
Maxillæ apertæ.
Palpi brevissimi, conici.
Mentum subtransversum, convexum.
Antennæ extrorsum crassiores: articulo extimo ovato lanceolato.
Corpus angustatum lineare.
Thorax globoso-conicus.

This

This genus is related to *Brentus*; but its tridentate mandibulæ and incrassate antennæ, taken in conjunction with its short and rather conical thorax, sufficiently distinguish it.

hæmoptera. 64. Rh.

PLATE XXII. FIG. 7.

Long. corp. (Rostro excluso) lin. $7\frac{1}{3}$.

Habitat in Australasia. Ex Musæo D. MacLeay accepi.

β. Ex Musæo D. Marsham.

Corpus angustum, lineare, atrum, obscuriusculum, subtus parce albido-pilosum. *Caput* deflexum, punctulatum, medio constrictum, postice convexum. *Rostrum* teres, capitis thoracisque longitudine, punctulatum, apice nitidum. *Antennæ* rostro pone medium insidentes, thorace longiores, basi attenuatæ glabræ, alias pilosissimæ: articulo primo clavato subarcuato crassiori, secundo brevi obconico, tertio sequentibus vix longiori subclavato, proximis duobus magnitudine crescentibus obconicis, reliquis æqualibus subobconicis, extimo ovato-lanceolato. *Oculi* hemisphærici, supra pilis rufis subtus albidis cincti. *Thorax* subconicus, antice constrictus, piloso-velutinus; utrinque vitta laterali intus subrepanda, linea dorsali, maculisque duabus posticis, piloso-fulvo-aureis. *Elytra* punctulatissima, pilosa, fulvo-aurea: sutura nigricanti. *Tibiæ* apice bicalcaratæ. *Tarsi* pulvinati. *Unguiculi* simplices.

Var. β. Thorace utrinque macula magna triangulari sanguinea, linea dorsali maculisque posticis nullis. Alias simillima. An eadem?

EURHINUS Kirby.

Labrum vix distinctum.

Labium subcordatum.

Mandibulæ apice tridentatæ: dentibus æqualibus acutis.

Maxillæ apertæ.
Palpi brevissimi, conici.
Mentum cordatum.
Antennæ integræ, basi submoniliformes, apice clavatæ: clava trifida perfoliata: articulo extimo *in maribus* longissimo cylindrico.
Corpus obcuncatum.
Thorax teretiusculus.

I sent a sketch of an insect of this genus to M. Latreille, and he was of opinion that it belonged to a genus he had constructed, but which is not yet published, under the name of *Orthorhynchus*. I have since been informed by him, that the type of that genus is *Lixus semipunctatus* Fabr., which from Olivier's figure appears to be more nearly related to *Lixus bidentatus* of Mr. Donovan, and is distinguished by acuminated elytra and filiform antennæ; whereas no species of *Eurhinus*, and there are several, has acuminated elytra, and the antennæ terminate in an oblong clava, the last joint of which, in the males, is very long. Olivier describes *Lixus semipunctatus* as *antennis moniliformibus vix extrorsum crassioribus* (v. 242. n. 242. *t.* xii. *f.* 141.) In *L. bidentatus* the antennæ are not *moniliformes*, but they are *extrorsum vix crassiores*. So that *Orthorhynchus* seems to be a connecting link between *Eurhynus*, the antennæ of which are submoniliform at the base, and *Lixus bidentatus*, but belonging to the same genus with the latter. There are several species of *Orthorhynchus* in Mr. MacLeay's rich cabinet. As *Lixus semipunctatus* is in the Banksian cabinet, it may be easily ascertained whether these observations are correct or not.

scabrior. 65. Eu. niger, piloso-incanus, elytris striatis, basi subcristatis, granulis tuberculisque acutis scabris.

PLATE

PLATE XXII. FIG. 8.

Long. corp. (Rostro incluso) lin. 9.

Habitat in Australasia. D. Brown: MacLeay.

Corpus fere obcuneatum, nigrum, pilositate parva plus minus incanum. *Caput* rugulosum, postice læve, inter oculos canaliculatum. *Oculi* minus prominuli. *Rostrum* thorace brevius, apice paulo latius, lateribus basi piloso-albidis, pone antennas punctatum. *Antennæ* rostro pone apicem insidentes, thoracis longitudine: articulo primo crassiusculo clavato, secundo brevi obconico, tertio sequentibus paulo longiori clavato, proximis quinque brevibus obconicis, tribus ultimis crassioribus: primo obconico, secundo brevi cylindrico, tertio *in maribus* longissimo cylindrico clavam longam perfoliatam formantibus. *Thorax* teretiusculus ex punctis confluentibus rugosus. *Elytra* striata: striis punctatis; interstitiis granulatis, et insuper serie tuberculorum acutorum muricatis, basi apud scutellum longitudinaliter elevata vel subcristata: crista muricata. *Tibiæ* calcaribus obsoletis. *Femora* antica reliquis crassiora.

lævior. 66. Eu. niger, piloso-albus, elytris striatis, basi subcristatis, striarum interstitiis lævibus.

Long. corp. (Rostro incluso) lin. 7.

Habitat in Australasia. D. MacLeay.

Præcedenti similis sed minor, corpore angustiori albidiori. *Antennæ* articulis brevioribus, 6°, 7°, et 8° globosis. *Thorax* lævior. *Elytra* striarum interstitiis lævibus, sed crista muricata est.

BRACHYCERUS Fabr.

* *Thorace spinoso.*

maculosus. 67. B. niger subcinereus, thorace spinoso late canaliculato, elytris nodulosis cinereo scriatim maculosis.

Long. corp. (Rostro incluso) lin. 14.

Habitat apud Promontorium Bonæ Spei. D. Green.

Corpus subovatum, crassum, obscurum, pollinoso-subcinereum. *Rostrum* inæquale, punctatum, postice triangulo elevato, utrinque ante oculos strangulatum. *Thorax* utrinque acute spinosus: spina valida, supra inæqualis, nodulis et tuberculis complanatis utrinque notandus: lineis duabus latis dorsalibus elevatis lævibus, canalem latum inter se includentibus. *Coleoptra* subglobosa, nodulosa, punctulis minutissimis confertissimis quasi reticulata, polline cinereo seriatim maculosa. *Pedes* rugosi.

* *Thorace inermi.*

verrucifer. 68. B. ater, thorace subcordato punctato, elytris globosis verrucosis.

Long. corp. (Rostro incluso) lin. 5.

Habitat apud Promontorium Bonæ Spei. D. Green.

Corpus ovatum, atrum glabrum. *Rostrum* punctatum, basi utrinque strangulatum. *Thorax* subcordatus: lateribus obtusangulis, sparse punctatus: punctis papillatis. *Coleoptra* globosa, tuberculis numerosis complanatis verrucosa.

This species is nearly related to *B. Spectrum* Fabr.; but the tubercles on the elytra are not disposed in rows as in that, being scattered irregularly.

RHINARIA Kirby.

Labrum vix distinctum.
Labium subtrapeziforme.
Mandibulæ edentulæ.
Maxillæ apertæ.
Palpi brevissimi, conici.
Mentum quadratum.

Antennæ

Antennæ integræ, capitatæ: clava triarticulata; articulis arctissime connexis.
Corpus oblongo-ovatum.
Thorax subglobosus.

The insect, which is the type of this genus, is altogether of the habit of the *Curculionidæ fracticornes brevirostres*, particularly *Curculio asper*, &c.: but its unbroken antennæ place it in this section, from all the genera of which it is *toto cælo* different. I found it in a collection of New Holland insects which I once purchased.

cristata. 69. Rh.

PLATE XXII. FIG. 9.

Long. corp. (Rostro excluso) lin. 4¾.

Habitat in Australasia.

Corpus oblongo-ovatum, subtus squamulis pallidum, supra griseum. *Caput* postice convexum, antice inter oculos crista squamoso-pallida tetragona: vertice quadruplici lobis subhemisphæricis. *Rostrum* capitis fere longitudine crassum, rectum, deflexum, tetragonum, lævissimum, glaberrimum, nitidum, nigrum, apice subtus utrinque dente triangulari acuto armatum, basi constrictum strangulatum, ante antennas elevatum. *Antennæ* rostro basi utrinque insidentes, articulo primo reliquis paulo crassiori, longitudine secundi, his duobus exceptis, qui et subclavati, articuli reliqui longitudine fere æquales sunt, tertio subcylindrico, proximis quinque obconicis, ultimis tribus paulo majoribus capitulum arcte imbricatum lanceolatum efformantibus. *Oculi* prominuli, subtriangulares, distincte reticulati. *Thorax* subglobosus, ex punctis confluentibus, nodulis intermixtis, scaber. *Elytra* subsulcata, squamosa: sulcis punctis ocellaribus albis ornatis, interstitiis serie setarum decumbentium et granulorum alternorum, notandis. In prona corporis

corporis pagina puncta ocellata sparsa utrinque conspici possunt.

** *Fracticornes.*

CRYPTORHYNCHUS Illig.

corruscans. 70. Cr. cupreo-auratus, nitidissimus, pedibus cyaneis, corpore rhomboidali, thorace postice lobato.

Long. corp. lin. $4\frac{1}{4}$.

Habitat in Brasilia. D. Hancock.

Insectum splendidissimum. *Corpus* fere rhomboidale, nitidissimum, glaberrimum, cupreo-auratum, splendore fere rubini fulgidum, levissime punctulatum. *Caput* postice viridi-sericeum, minus nitidum, antice cupreum: fovea impressa. *Rostrum* thoracis longitudine, inflexum, rectiusculum, cylindricum, apice paulo latius, viride, basi cupreum. *Antennæ* nigræ, rostri medio insidentes. *Thorax* subhemisphæricus, antice constrictus, postice lobatus: lobo rotundato. *Scutellum* triangulare. *Elytra* triangularia, striata: striis levissime punctulatis; interstitiis lævibus, sublacunosa: humeris valde gibbis. *Pedes* cyanei. *Tibiæ* vix calcaratæ, apice intus bispinosæ. *Abdomen* viridi-auratum.

Leachii. 71. Cr. ater, unicolor, corpore rhomboidali, thoracis dorso elevato, pectore bicorni.

Long. corp. (Rostro excluso) lin. 5.

Habitat in Brasilia. D. Hancock.

Habitus Cryptorhynchi Spiculatoris D. Humboldt. *Corpus* rhomboidale, glaberrimum, læve, obscurum, totum aterrimum. *Rostrum* thorace longius, arcuatum, punctulatum. *Antennæ* rostri medio subtus insidentes: capitulo ovato-lanceolato. *Oculi* magni, planiusculi. *Thorax* antice constrictus: lateribus rotundatis, dorso postice maxime elevatus. *Scutellum* quadratum.

Elytra

Elytra triangularia, striata: striis subpunctatis, humeris valde gibbis. *Pedes* punctulati: femoribus subtus dente acuto. *Tibiæ* inermes, posticæ elevato-lineatæ. *Pectus* inter pedes anticos, utrinque cornu elongato, arcuato, declivi armatum. *Sexus alter* minor: pectore inermi.

In honorem D. G. E. Leach, M.D.S.L.S., *insectorum et animalium aliorum indefessi oculatissimi et perspicacissimi indagatoris.*

Arnoldi. 72. Cr. ater, corpore rhomboidali, pectore bicorni, thorace rufo postice lobato.

Long. corp. (Rostro excluso) lin. 3.

Habitat in Brasilia. D. Hancock.

Similis admodum præcedenti, sed *Corpus* nitidum, subtus punctatum. *Rostrum* arcuatum, compressum, apicem versus sensim angustius. *Thorax* transversus, rufus, lævissimus, antice haud constrictus, postice lobatus. *Elytra* humeris minus gibbis, striis magis exaratis. *Pectus* cornubus minoribus. *Sexus alter* major: pectore inermi.

Observatori morum insectorum cordato, D. Arnold, M.D.S.L.S., *hæc species inedita dicatur.*

RYNCHÆNUS Fabr.

Dufresnii. 73. R. subcylindricus, coleoptris maculis sex aurantiis, basi triangulo magno obverso pallido.

PLATE XXII. FIG. 10.

Long. corp. (Rostro excluso) lin. $8\frac{3}{4}$.

Habitat in Brasilia. D. Hancock.

Corpus subcylindricum, fere cuneiforme, subtus pilis decumbentibus pallidum. *Caput* inflexum, nigrum, *pilis* pallidis, præcipue postice et ad basin rostri, consitum. *Rostrum* crassiusculum,

culum, capite longius, pallido-pilosum, apice glabrum punctatum. *Antennæ* pone apicem rostro insidentes: capitulo ovato-lanceolato quadriarticulato: articulis arctissime connexis, unde capituli solidi speciem exhibet. *Oculi* ovales, minus prominuli. *Thorax* subglobosus, antice constrictus, nodulis minutis scaber, dorso carinatus, velutino-ater, postice piloso-pallidus. *Coleoptra* item in locis nodulosa, atra: maculis sex magnis subrotundis aurantiis, ex pilis vel squamulis decumbentibus, densis confectis, basi triangulo magno obverso piloso-pallido, pilis minus confertis, apice subcompressa. *Pedes intermedii* reliquis breviores. *Femora* dente brevi armata.

Viro mihi amicissimo, qui musæum insectis, avibus, conchyliis rarissimis exuberans collegit, ordinavit, D^no^ Dufresne, *Musæi Regalis Parisiens. curatori digno, sit species hæc pulchra dicata.*

Roddami. 74. R. oblongus, cinerascens, coleoptris verrucosis, fasciis duabus albis.

Long. corp. (Rostro excluso) lin. $15\frac{1}{3}$.

Habitat in Brasilia. D. Hancock.

Maximus in hoc genere. *Corpus* oblongum, squamulis piliformibus subtus albidum. *Caput* deflexum, squamulis incanum. *Rostrum* thoracis fere longitudine, glabrum, levissime punctulatum, subcylindricum, apice paulo latius. *Antennæ* prope basin rostro insidentes: articulo primo haud ita elongato: articulo octavo reliquis subito majori, sed a clava distincto: clava ovata triarticulata. *Oculi* subovati, subprominuli. Thorax conicus, tuberculis et nodulis sparsis muricatus, ex pilis fulvo-cinereus, postice macula subcirculari squamoso-albida. *Elytra* striata: striis excavato-punctatis, interstitiis complanato-verrucosis, squamoso-fulvescentia: fasciis duabus, anteriori magna arcuata a humeris ad medium usque ducta, posteriori transversa,

versa, squamoso-albis. *Poststernum* concavum: lateribus ad recipiendum rostrum reflexis. *Tibiæ* validissime calcaratæ.

Reidi. 75. R. ovatus ater, thoracis basi et apice, elytrisque fasciis margine connexis nigro-punctatis, flavis.

Long. corp. (Rostro excluso) lin. $11\frac{1}{3}$.

Habitat in Brasilia. D. Hancock.

Corpus atrum, ovatum, obscurum. *Caput* inflexum. *Rostrum* thorace vix brevius, depressum, planum, subcarinatum, apice labro distincto cordato minuto in medio terminatum. *Antennæ* piceæ, rostro ante basin insidentes, et ejus fere longitudine: articulo octavo præcedentibus subito majori; clava brevi ovata triarticulata. *Thorax* conicus, antice, dorso postice, et lateribus, squamoso-flavus. *Tubercula* quædam sparsa in thorace etiam notanda. *Elytra* punctato-striata: striis interstitiis parce complanato-verrucosis; fasciis quatuor sinuatis, nigro maculatis, margine connexis, squamoso-flavis. *Postpectus* basi et apice utrinque squamoso-flavum. *Poststernum* ad recipiendum rostrum excavatum. *Tarsi* ex pilis fulvo-aurei.

In honorem D. Geo. Roddam, M.D. et D. Dav. Reid, chirurgi, *qui ambo plurima insecta hactenus inedita summo studio collegerunt, hoc Curculionidarum par nominatur.*

CURCULIO Linn.

Hancocki. 76. C. corpore squamoso: squamulis aurato-virescenti-cæsiis, coleoptris gibbis quadritubereulatis: humeris apicibusque mucronatis.

PLATE XXII. FIG. 11.

Long. corp. (Rostro incluso) lin. $15\frac{1}{2}$.

Habitat in Brasilia rarissime, semel lectus. D. Hancock.

Insectum splendide pulcherrimum. *Corpus* totum squamulis minutissimis, subrotundis, virescenti-cæsiis, auratis micans. *Caput* porrectum, brevissimum, subtus atro-bivittatum. *Rostrum* crassum, tetragonum, capite longius, supra canaliculatum, apice emarginatum: mandibulis porrectis, conicis, truncatis, vertice insculptis tuberculo parvo centrali. *Mentum* excavatum. *Antennæ* in nostro specimine mutilatæ, sed articulus tertius elongatus. *Thorax* suborbiculatus, depresso-planus, tuberculo laterali atro utrinque in medio armatus. *Elytra* pone medium apud suturam elevato-obtusangula: angulo tuberculo obtuso coronato, disco in medio alio minori complanato, atris. Inter hæc tubercula fascia sinuata obsoleta pallide aurea notanda. *Elytra* basi intus obtuse subdentata, humeris mucronatis recurvis, apice etiam mucronata sunt. *Pedes* setosi. *Femora posteriora* fasciis duabus atris. *Tibiæ* vix calcaratæ. *Abdomen* segmentis ultimis macula basis triangulari nigra.

In honorem D. Hancock, *Classis Regiæ Navarchi, qui innumera insecta, quamplurima inedita, mei gratia in Brasilia collegit, et mihi benevolentissime dono dedit, hoc splendidissimum insectum nominavi.*

Marshami. 77. C. niger, thorace utrinque elytrisque disco, spinosis, rostro brevissimo cristato.

Long. corp. (Rostro incluso) lin. $9\frac{2}{3}$.

Habitat in Australasia. D. Marsham.

Corpus ovato-oblongum, glabrum, obscurum, nigrum. *Rostrum* crassissimum, subcylindricum, basi utrinque crista compressa bifida: lobis rotundatis, apice ante antennas tuberculo compresso munitum, antice emarginatum: lobis divaricatis; labro intermedio triangulari. *Mandibulæ* magnæ, crassæ, trigonæ, edentulæ, supra rugolosæ, apice acutæ. *Antennæ* articulis, primo

primo elongato excepto, obconicis, tertio sequentibus longiori, octavo elongato clavato tres ultimos brevissimos excipiente, et clavam subsolidam quasi petiolatam simul formante. *Thorax* medio postice elevato-lineatus: dorso utrinque nodosus, lateribus bispinosis: spina anteriori longiori emarginata, sub spinas latera deflexa varie plicata. *Elytra* oblonga, rugosa, seriatim spinosa: seriebus tribus, duabus interioribus anum versus abbreviatis, exteriori dimidiata; spinis acutis. Serierum interstitia seriatim nodulosa. Elytrorum latera et apex deflexa.

This species, as well as that which precedes it, would in a modern system doubtless form two genera, from the remarkable difference in their mandibles. But since, in a late number of Germar's *Magazin der Entomologie* (Zwieter Band, p. 339) the names of 52 genera of *Curculionidæ* are given, amongst which these may probably be included, I judged it best to give them for the present as *Curculiones*.

Amico mihi semper facili et bencvolo auctori Entomologiæ Britannicæ celebri hoc insectum sacrum esse volui.

elegans. 78. C. angustus, viridi-auratus, thorace vittis quatuor, elytris plurimis atris.

PLATE XXII. FIG. 12.

Long. corp. (Rostro incluso) lin. $7\frac{1}{4}$.

Habitat in Brasilia. D. Hancock.

Animal elegantissimum, statura fere *C. Sprengleri*, sed angustius. *Corpus* ovato-lanceolatum, angustum, squamulis viridi-auratis micans, subtus subvillosum; lateribus nigro maculatis. *Rostrum* tetragonum, supra carinatum. *Antennæ* clava lanceolata, quadriarticulata. *Thorax* subcylindricus, vittis alternis atris et viridi-auratis: his nigro punctatis, eleganter variatus. *Elytra* vittis,

lineolis, maculisque, atris et viridi-aureis quasi tessellata. *Pedes* villosi. *Abdomen* segmento ventrali ultimo supra carinato. *Sexus alter* segmento abdominis anali plano et minime carinato.

(*Cerambycidæ.*)

PRIONUS Fabr.

Spencii. 79. P. thorace inermi carinato, testaceo: vittis duabus nigris, elytris nigris: fascia obliqua fulva.

PLATE XXII. FIG. 13.

Long. corp. lin 16.

Habitat in Brasilia. D. Hancock.

Corpus oblongum, nigrum, glabrum. *Caput* testaceum utrinque postice nigrum. *Labrum* transversum, breve, parvum. *Mandibulæ* porrectæ, testaceæ, edentulæ, apice incurvæ nigræ, acutissimæ. *Mentum* transversum. *Genæ* apice bidentatæ: dente exteriori majori. *Antennæ* thorace paulo longiores, compressæ, subserratæ, pilosæ, nigræ: articulo primo subtus flavo. *Thorax* transversus, confluenter punctatissimus, antice emarginatus, postice sublobatus: lobo intermedio rotundato, lateralibus obtusis, testaceus: maculis binis oblongis dorsalibus nigris; margine laterali reflexo undante, sinuato, dorso tricarinatus: carinis lateralibus arcuatis antice abbreviatis. *Elytra* confluenter punctulatissima, nigra: fascia magna, media, obliqua, fulva, prope suturam carina dorsali. *Pectus* testaceum, utrinque macula nigra. *Postpectus* inter pedes flavescens. *Femora* apice testacea. *Abdomen* medio longitudinaliter flavum.

Viro in Entomologia apprime docto, oculatissimo, coadjutori strenuo utilissimo amicissimo Gulielmo Spence, S.L.S. *hoc insectum ab amico suo dicatur.*

LAMIA

LAMIA Fabr.

speculifera. 80. L. cinerea, thorace, elytrisque basi, spinosis, his lunula lævigata nitidissima.

Long. corp. lin. 6.

Habitat in Brasilia. D. Hancock.

Affinis videtur *L. tribulo* et *horridæ* Fabr. sed penitus distincta. *Corpus* oblongum, ex pilis tenuissimis decumbentibus cinereum, pilis longioribus rectis sparsis subhirtum. *Caput* inter oculos sparse punctatum, piloso-fuscum : fascia inter antennas pallida. *Mandibulæ* nigræ, lævissimæ. *Antennæ* mediocres, piloso-cinereæ, subtus hirsutæ. *Thorax* subcylindricus : spina elongata ascendente acutissima apice nigra utrinque armatus, spinis insuper quatuor, antico obsoletissimo, brevissimis dorsalibus in rhombum ordinatis, linea elevata inter se et cum lateralibus connexis. *Scutellum* quadratum, fuscum. *Elytra* basi spinis duabus validis acutis, anteriori humerali, oblique positis armata, lunula longitudinali, lævigata, glaberrima, nitidissima, fusca, speculum instar micanti notanda, apice spina laterali mucronata.

annulicornis. 81. L. plumbea, thorace spinoso, utrinque albo, elytris carinatis latere albidis, antennis annulatis.

Long. corp. lin. 8¾.

Habitat in Brasilia. D. Hancock.

Corpus lineare, nigrum, ex pube brevissima plumbeum. *Caput* sub oculos et linea intermedia piloso-album, supra canaliculatum. *Mandibulæ* apice bidentatæ. *Antennæ* breviores, nigræ : articulis basi albis, intermediis subtus atro-barbatis. *Thorax* lateribus

lateribus piloso-albis, postice spina obtusa armatis. *Elytra* linearia, apice paulo latiora rotundata, punctatissima, apud latus, apice excepto, piloso-alba. *Anus* subtus ex pilis albus. *Pedes* basi fulvi.

fragifera. 82. L. fusca, thorace subspinoso, elytris apice cristatis, basi tuberculo fragiformi.

Long. corp. lin. 9.

Habitat in Brasilia. D. Hancock.

Corpus oblongum, subtus disco villoso-fulvescenti, supra ex pilis cinerascente-fuscum nigro subnebulosum. *Caput* subinflexum. *Mandibulæ* latæ, edentulæ, nigræ. *Vertex* canaliculatus: punctis binis obliquis atris. *Antennæ* breviores, ex tuberculo provenientes: articulis fuscis, basi pallidis; primo apice valde incrassato fulvo. *Scutellum* subquadratum, fulvo-pilosum. *Elytra* fusca, subnebulosa, rugosa, apice cristata: crista pilis coronata; lineola transversa alba antice adjacente, postice tuberculo magno hemisphærico fragiformi, vel tuberculis pluribus minoribus aciniformibus exasperato. *Humeri* etiam elytrorum tuberculato-rugosi. *Pedes* nebulosi.

aculeicornis. 83. L. oblonga cinerea, thorace spinoso, elytris basi subcristatis, antennis apice unguiculatis.

Long. corp. lin. 6.

Habitat in Brasilia. D. Hancock.

Valde affinis *L. Scorpioni*, sed multo minor, elytris basi tantum cristatis. *Corpus* totum cinereum, nec subtus et thorace album. *Tibiæ* item anticæ haud dilatatæ—alias simillima.

This insect, as well as *Lamia Scorpio*, exhibits a most extraordinary character; the terminal joint of the antennæ exactly resembles

bles a claw, such as arms the tarsi of many insects. This character, perhaps, would indicate a separate genus, but in every other respect these are true *Lamiæ*. What may be the use of this claw is not ascertained; it is probably for the purpose of laying hold of surfaces.

CERAMBYX Linn.

hirticornis. 84. C. ater, thorace sexspinoso testaceo nigro maculato, elytris testaceis dimidiato-nigris, antennis barbatis.

Long. corp. lin. 11.

Habitat in Brasilia. D. Hancock.

Affinis *Cerambyci barbicorni*. *Corpus* oblongum, subdepressum, atrum. *Caput* suborbiculatum: gula mandibulisque testaceis, supra velutino-atrum: vitta media obscuriuscula fulvo-aurea. *Genæ* apice bidentatæ: dente exteriori majori. *Antennæ* mediocres, atræ: articulis intermediis hirtis, subtus barbatis. *Thorax* obtuse sexspinosus: spinis quatuor obtusis lateralibus, anterioribus brevioribus, et unica utrinque postice in dorso, testaceus: macula magna dorsali subtriangulari vittisque duabus lateralibus, nigris. *Scutellum* atrum. *Elytra* testacea: apice late humerisque velutino-atris: linea dorsali elevata longitudinali sinuata glabra apicem haud attingente. *Femora* basi testacea. *Sternum* et *Poststernum* elevata obtusa: hoc antice excavato.

STENOCORUS Fabr.

hirtus. 85. St. piceo-æneus, hirtus, thorace submutico, elytris maculis duabus pallidis.

Long. corp. lin. $11\frac{1}{4}$.

Habitat in Brasilia. D. Hancock.

Corpus lineare, nigro-piceum, æneo tinctum, pilis cinereis longiusculis

usculis sparsis hirtum. *Caput* horizontale, inter oculos canaliculatum. *Genæ* apice spina armatæ. *Antennæ* articulis inferioribus apice spinosis. *Thorax* punctatus, cylindricus, utrinque bituberculatus, dorso tuberculis quinque lævibus glabris in quincunce ordinatis. *Scutellum* sericeum, pallidum. *Elytra* punctata: macula intermedia irregulari obliqua exterius ramum emittente, aliaque apicis angulata, pallidis, apice bispinosa.

SAPERDA Fabr.

hirsuticornis. 86. S. nigra, thorace elongato, utrinque vitta argentea, coleoptrisque aurea, antennis medio fasciculatim barbatis.

Long. corp. lin. 9.

Habitat in Brasilia. D. Hancock.

Corpus lineare, angustatum, obscurum, nigrum. *Caput* inclinatum, vel declive. *Palpi* labiales maxillaribus longiores. *Antennæ* mediocres, piceæ, articulis tribus intermediis elongatis sulcatis, atro fasciculato-hirsutis. *Thorax* elongatus, cylindricus, infra apicem constrictus, utrinque linea pallida piloso-argentea. *Elytra* dorso plana, latere deflexa: vitta angusta intermedia piloso-aurea. *Femora* filiformia apice clavata: clava lanceolata.

scopulicornis. 87. S. rufo-picea, thorace elongato, elytris vitta aurea, antennis articulo quinto apice scopula stellari.

Long. corp. lin. 5.

Habitat in Brasilia. D. Hancock.

Affinis præcedenti. *Corpus* lineare, angustatum, totum rufo-piceum, obscurum. *Antennæ* mediocres, subtus pilis longis sparsis, barbatæ: articulo quinto apice scopula quinque-radiata, sive

sive ex fasciculis quinque pilorum nigrorum divergentium constante. *Thorax* antice et postice constrictus. *Elytra* vitta dorsali angustissima utrinque abbreviata, pallide aurea. *Femora* fere ut in præcedente.

NECYDALIS Linn.

aurulenta. 88. N. aureo-pubescens, elytris subulatis fulvis: vitta laterali furcata nigra, antennis apice extus serratis.

Long. corp. lin. 10.

Habitat in Brasilia. D. Hancock.

Corpus pube fulvo-aurea vestitum. *Caput* inter oculos carinatum: carina canaliculata, pone antennas pube subferruginea. *Antennæ* thorace longiores, sensim crassiores, nigræ, apice extus serratæ. *Thorax* subglobosus, depressus, pube aurea et fusco-ferruginea nebulosus, postice constrictus: lineis tribus dorsalibus elevatis; exterioribus arcuatis, glabris lævibus, postice utrinque spatio glabro, excavato-punctato. *Elytra* subulata, corpore paulo breviora, fulva, punctata: vitta marginali antice furcata, suturaque nigris. *Pedes* rufi: femoribus tibiisque medio nigricantibus. *Femora* quatuor anteriora incrassata, postica clavata. *Tibiæ* posticæ apice barbatæ. *Abdomen* rufum, aureo-pubescens.

barbicrus. 89. N. nigra, elytris abbreviatis subulatis, macula hamata alba, tibiis posticis undique barbatis.

Long. corp. lin. 6.

Habitat in Brasilia. D. Hancock.

Corpus lineare, angustum, nigrum, subtus piloso-incanum. *Caput* punctulatum, inter oculos canaliculatum. *Antennæ* breviores, extrorsum crassiores, apice intus serratæ, rufo fuscoque variæ.

Thorax brevis, subcylindricus, reticulato-punctatus: punctis papillatis, postice utrinque tuberculo dorsali lævi. *Elytra* brevissima, subulata, punctatissima: vitta antice intus uncinata et in medio obtusangula, lævi, pallida. *Pedes* postici testacei; tibiis, basi nuda excepta, undique atro dense barbatis. *Anus* rufus.

(*Crioceridæ.*)

MEGALOPUS Oliv.

sexmaculatus. 90. M. flavus, subtus fascia, capitis vertice, thoracis dorso, coleoptrisque maculis sex, atris.

Long. corp. lin. 5.

Habitat in Brasilia. D. Hancock.

Corpus oblongum, flavum, punctulatum: punctulis piligeris. *Caput* triangulare, postice inter oculos nigrum. *Antennæ* nigræ. *Collum* dorso nigro. *Thorax* teretiusculus, antice constrictus: dorso macula, utrinque angulata postice rotundata, nigra. *Elytra* fascia humerali, maculaque magna medii et apicis, lineolaque marginis, atris. *Postpectus* fascia lata nigra. *Tibiæ* posticæ arcuatæ, *tarsique* omnes, nigra. *Femora* postica valde incrassata.

(*Hispidæ.*)

ALURNUS Fabr.

rostratus. 91. A. fronte rostrata, supra testaceus, thorace vitta dorsali elytris apice, corporeque nigris.

Long. corp. lin. 7.

Habitat——Ex Musæo D. Drury.

Corpus lineare, angustum, glabrum, atrum. *Caput* rufum, clypeo in rostrum breve apice truncatum, supra sulco exaratum nigrum, subtus declive rufum, producto. *Os* sub capite inter oculos. *Antennæ*

tennæ in nostro specimine desunt. *Oculi* magni, laterales. *Thorax* planiusculus, quadratus: angulis anticis truncatis, postice sublobatus, confluenter excavato-punctatus, rufus: vitta dorsali nigra. *Elytra* striata: striis lineis elevatis decussatis, unde excavato-punctatæ, rufa, apice nigra. *Pectus* rufum. *Alæ* nigræ.

This insect, which I purchased from the late Mr. Drury's collection, appears to vary both from *Alurnus* and *Hispa*, and might perhaps constitute a new genus; but as my specimen has no antennæ, I have for the present considered it as an *Alurnus*.

(*Chrysomelidæ.*)

LAMPROSOMA Kirby.

Labrum subquadratum, apice deflexum.
Labium minutissimum, oblongum.
Mandibulæ apice incumbentes, edentulæ.
Palpi crassi, subclavati.
Mentum minutissimum, oblongum.
Antennæ subclavatæ: clava compressa subserrata.
Corpus hemisphæricum fere, dorso gibbo.
Caput inflexum, a thorace receptum.
Thorax postice lobatus.

One species of this genus has been described by Fabricius as a *Chrysomela* (*C. Globus*), and another by Olivier as a *Eumolpus* (*E. globosus*). It exhibits much more affinity to *Clytra*, from which however it is sufficiently distinguished by its labrum, mandibulæ, and palpi, as well as by the globose form of its body.

bicolor. 92. L. supra cupreo-fulgidum, subtus cyaneum.

PLATE XXII. FIG. 15.

Long. corp. lin. $4\frac{1}{2}$.

Habitat in Brasilia. D. Hancock.

Corpus subglobosum, antice angulatum, glaberrimum, subtus cyaneum, supra nitidissimum splendore cupreo fulgidum. *Caput* suborbiculatum, deflexum, punctulatum, inter oculos fovea oblonga impressum. *Os* nigrum: mandibulis validis apice rotundatis. *Antennæ* capite vix longiores, nigræ: articulo primo magno subcompresso, subrhomboidali, vel antice et postice obtusangulo, secundo brevi et fere conico, quarto minutissimo subgloboso, sequentibus tribus brevibus obconicis; reliquis majoribus subtriangularibus, clavam compressam subserratam formantibus. *Oculi* magni, laterales, subreniformes. *Thorax* antice emarginatus, postice lobatus: lobo apice rotundato, lateribus obliquis, supra punctulatus. *Scutellum* minutissimum, acuminatum. *Coleoptra* dorso gibbo, punctato-striata, lateribus angulata. *Sternum* oblongum, punctatum. *Pedes* violacei. *Femora* subtus pro receptione tibiarum longitudinaliter excavata. *Tibiæ* apice vix calcaratæ.

CHLAMYS Knoch.

Bacca. 93. Ch. atra, supra cupreo-aurata, thorace bilobo, elytris muricatis punctatis: sutura denticulata.

Long. corp. lin. 4.

Habitat in Brasilia. D. Hancock.

Animal singulare, baccam rubicundam acinis constantem superficie rugoso simulans. *Corpus* crassum, subquadratum, fere pentagonum, glabrum, subtus punctatum, atrum, supra obscure cupreo-auratum, sericeum. *Caput* orbiculatum, deflexum, fere totum in thorace receptum, quasi concentrice rugulosum: clypeo distincto, subtriangulari, punctato. *Labrum* subquadratum, rufum. *Palpi* subfiliformes, *labiales* articulo secundo haud extus producto. *Labium* rufum, emarginatum. *Antennæ* rufo-piceæ, subserratæ; articulo primo elongato clavato arcuato. *Thorax* minu-

minutissime rugulosus, cupreo-auratus, dorso elevato bilobo: lobis emarginatis, antice constrictus, postice lobatus, lobo bifido. *Coleoptra* quadrata, tuberculato-muricata: tuberculis subtrigonis, anticis acutis, reliquis obtusis anterius excavatis: suturis denticulatis, lateribus profunde sinuata. *Sternum* elevatum, os claudens. *Femora* subtus cuprea, pro receptione tibiarum longitudinaliter excavata. *Anus* inflexus. *Segmenta* antica brevissima, et quasi plicata, anali profunde excavato.

This species seems to differ from the others of the genus in the structure of its labial palpi, since they are not at all furcated. Whether the other species have the sutures denticulated I do not know, having only this species of the genus. Olivier does not notice it. The circumstance is so unique and remarkable, that if they have it not, it would indicate that *C. Bacca* belongs to a distinct genus.

(*Choragidæ.*)

CHORAGUS Kirby.

Palpi subsetacei: articulo extimo acuto.
Antennæ clavatæ: clava triarticulata, basi articulis duobus primis incrassatis.
Corpus cylindricum.
Caput inflexum: clypeo elongato.

After repeated examinations under a powerful magnifier, I have not been able clearly to discover more than three joints in the tarsi of this insect; but Mr. Curtis in one tarsus detected four. Indeed its general habit, &c. connect it with the *Tetramera*, especially *Cis* and *Cryptocephalus*: it will not however well arrange under any of the present families of that section of *Coleoptera*; I have therefore considered it as the type of a new one, to which some other nondescript genera in my cabinet belong.

Shep-

Sheppardi. 94. Ch.

PLATE XXII. FIG. 14.

Long. corp. lin. ¾.

Habitat in Anglia. Apud Offton in Suffolcia a D. Sheppard rarius lectus, strenue saltans.

Corpus oblongum, cylindricum, piceum, pilositate parva obscurum. *Caput* subinflexum, subtriangulare, punctulatissimum: clypeo plano subelongato. *Mandibulæ* acutæ, edentulæ. *Palpi* subsetacei: articulo extimo acuto et fere subulato. *Antennæ* thoracis fere longitudine, nigræ: articulis duobus primis magnis incrassatis rufis, tertio brevi obconico, quarto subelongato cylindrico, sequentibus quatuor obconicis, tribus ultimis præcedentibus subito majoribus, nono et decimo obconicis extimo fere ovato, clavam laxam efformantibus. *Oculi* subrotundi, planiusculi. *Thorax* ex globoso conicus, convexus, punctulatissimus: puncto utroque sub lente forti centro eminenti. *Scutellum* vix ullum. *Coleoptra* oblonga, striata: striis punctatis. *Tibiæ* rufæ submuticæ. *Tarsi* item rufi: articulo intermedio reliquis latiori. *Unguiculi* duo brevissimi.

Entomologo cordato oculatissimo Revetto Sheppardo, A.B. S.L.S. *hoc insectum ab ipso solummodo adhuc inventum, et mihi benevole communicatum, merito dicatur.*

ORTHOPTERA.

BLATTA.

Mouffeti. 95. B. fusca, thorace antice reflexo utrinque angulato.

Mouffet 130, fig. infima.

Kirby and Spence *Introduct. to Entomology*, ii. 329.

Long. corp. lin. 22.

Habitat in Brasilia frequens. D. Hancock.

Corpus

Corpus depressum, totum fuscum, obscurum. *Caput* utrinque sub oculos apud antennarum basin interne puncto pallido. *Thorax* supra rugosus, antice fulvus; margine antico emarginato, et laterali exciso, reflexis pallidis, disco gibbus. *Tarsi* articulis omnibus pulvillatis.

Var. β. Elytris, thoraceque luridis.

MANTIS.

sinuata. 96. M. fusco-cinerea, oculis spinosis, elytris sinuatis alarum longitudine.

Long. corp. lin. 24.

Habitat in Brasilia. D. Hancock, ♀ in Mus. D. MacLeay.

♂.

Affinis *M. oculatæ* et *lobatæ* Fabr. Folium aridum exactissime refert. *Corpus* fusco-cinereum, obscurum. *Oculi* ovales, spina acuta sursum terminati. *Antennæ* setosæ, fulvæ, submoniliformes: articulis ultra 30 brevissimis turbinato-conicis. *Thorax* utrinque ante medium in angulum obtusum dilatatus. *Brachia* fulvescunt. *Elytra* longitudine alarum, latere externo sinu magno posterius excisa. *Alæ* fusco maculatæ. *Abdomen* fuscum.

♀.

Antennæ medio crassiores, duodecim-articulatæ: articulo primo crassiori longiori cylindrico, secundo minimo cylindrico, tertio elongato subclavato, reliquis cylindricis, ultimis quinque magnitudine sensim decrescentibus.

Those *Mantes* whose eyes terminate in a spine seem to form a separate family from the rest, if they may not rather be considered as a genus; for, besides the above singular character afforded by the eyes, their antennæ are very different both in the number and form of the joints of which they are composed.

HEMI-

HEMIPTERA.

FULGORA.

Lathburii. 97. F. fronte rostrata ascendente, elytris viridibus, albo flavoque ocellatis, alis luteis apice nigris.

Long. corp. lin. 18.

Habitat in China. Ex Mus. D. Lathbury.

Affinis *F. candelariæ*, sed rostrum supra nigrum, apice tantum rufo. *Truncus* disco nigro. *Elytra* nigro-viridia: vasis luteis, maculis pluribus sparsis ocellaribus, pupilla lutea, iride alba. Puncta quædam alba in margine interiori. *Abdomen* pallidum, nigro maculosum.

ARACHNIDES Lamarck.

(*Phalangidæ.*)

GONYLĒPTES Kirby.

Character essentialis.

Mandibulæ chelatæ.
Palpi unguiculati.
Tarsi 6—10-articulati.

Character naturalis.

Corpus triangulare. *Caput* thorace multo angustius, et ab illo linea impressa obtusangula: angulo anum spectante separatum, antice in medio biemarginatum, utrinque rectum, tuberculo vel cornu dorsali basi oculigero: oculis binis rotundis prominulis, armatum. *Mandibulæ* inflexæ, biarticulatæ: articulo primo subito apice valde incrassato, ultimo subovato chelato. *Maxillæ* nullæ, ni coxæ pedum anticorum pro maxillis habendæ. *Labium* pectorale, pharynge duplici. *Palpi* quinque-articulati, incurvi: articulo primo fere obcampanulato, secundo longiori subcylindrico, tertio brevi incurvo, quarto crassiori subcylindrico,

drico, intus aculeato: aculeis pluribus setiformibus mobilibus, ultimo subovato intus aculeato, apice unguiculato: ungue incurvo. *Thorax* suborbiculatus: lateribus marginatis incrassatis. *Pedes* octo: coxis sex anterioribus arcuatis basi subcoalitis, intermediis longioribus, posticis duobus maximis cum postpectore coalitis et vix linea impressa separatis, extrorsum rotundatis, supra apice spina valida armatis, trochanteribus brevibus cylindricis, femoribus cylindricis: posterioribus spinosis genubus convergentibus, tibiis triarticulatis: articulo primo brevi incrassato campanulato, secundo tenuiori longiori cylindrico, tertio gracili longo filiformi apice bicalcarato, tarsis filiformibus pilosis: anticis sexarticulatis, antepenultimis septem- vel undecim-articulatis, penultimis brevioribus sex- vel septem-articulatis, posticis octo-articulatis: articulo primo obsoletiusculo, secundo reliquis longiori, penultimo brevissimo. *Tarsi* omnes unguiculati, sed in quatuor anterioribus unguiculus internus obsoletus. *Sternum* inter pedes sex anteriores angustissimum, subcuneiforme. *Poststernum* inter coxas posticas et ab eis linea impressa levi separatum, fere sagittatum, postice utrinque spiraculo lunari pertusum. *Abdomen* brevissimum, interdum retractum, segmentis brevissimis et quasi plicatis, dorsalibus quatuor, ventralibus sex, analibus majoribus.

This genus belongs to Latreille's *Arachnides Trachéennes Holètres*, and should come before *Phalangium*, to which it is nearly related. It is sufficiently distinguished from that genus by its triangular body, immense posterior coxæ coalite with the postpectus and scarcely separated from it, except anteriorly, even by an impressed line; and more particularly by not having more than eleven joints in any of its tarsi. The third joint of the tibiæ may by some perhaps be regarded as the first joint of the tarsus, but

the spurs which arm its apex sufficiently prove that it belongs to the tibiæ. The knees of the hind-legs of these extraordinary insects converge; and being armed with spines, seem adapted to catch or retain their prey; and probably on this account it is that the coxæ of these legs are so strong.

It seems to me that this genus and *Phalangium*, instead of coming after the *Pycnogonidæ*, as Latreille has arranged them, should precede those marine animals, since their affinity to the spider tribe, scorpions, &c., is much greater.

aculeatus. 98. G. cornu oculigero inclinato, thorace aculeato: aculeo incurvo, coxis posticis extus spina bidentata.

Long. corp. lin. 6.

Habitat in Brasilia. D. Hancock.

Corpus glabrum, læve, obscurum, fusco-rufum. *Caput* cornu dorsali oculigero elevato, acuto, inclinato. *Thorax* subnebulosus, transverse seriatim nodulosus: margine laterali exteriori pallide flavo, interiori incrassato noduloso, postice in medio spina aculeiformi validissima, incurva, acuta, basi sinistrorsum bidentata, dextrorsum unidentata terminatus. *Pedes* sordide pallidi: coxis fuscis, penultimis postice pectinatis: pectine fixo sexdentato, posticis extus spina robustissima apice bidentata armatis. *Femora postica* fusca, nodulosa, subtus prope basin spina validissima obtusa pluribusque aliis minoribus unicaque dorsali armata. *Genua* item intus bispinosa. *Tibiæ posticæ* articulis duobus primis nodulosis, intus acute spinosis. *Abdomen* inter coxas retractum et quasi intrusum.

horridus. 99. G. cornu oculigero brevi bidentato, thorace tuberculis binis, coxisque posticis spina furcata, armatis.

PLATE

PLATE XXII. FIG. 16.

Long. corp. lin. 6¾.

Habitat in Brasilia. D. Hancock.

Corpus fusco-rufum, glabrum, læve, obscurum. *Caput* elevatum: cornu oculigero brevissimo bidentato: dentibus distantibus. *Thorax* postice tuberculis binis dorsalibus elevatis, in margine punctis elevatis pallidis. *Puncta* quædam alia elevata in thorace notanda. *Pedes* elongati. *Coxæ posticæ* extus spina elongata apice furcata terminantur. *Trochanteres* et *femora postica* spinosa: spinis pluribus longitudine variis; unica prope basin elongata hinc emarginata. *Sternum* tricarinatum. *Abdomen* apertum: segmentis dorsalibus punctis elevatis callosis albis notatis.

Var. β. Abdomine subtus fusco rufoque marmorato.

scaber. 100. G. cornu oculigero bifido, thoracis disco seriatim tuberculato, coxis posticis spina apice recurva.

Long. corp. lin. 3¾.

Habitat in Brasilia. D. Hancock.

Corpus griseum, obscurum, subtus subsetosum et granulis scabrum. *Caput* cornu oculigero elevato apice bispinoso. *Thorax* postice tuberculis quatuor oblongis magnis: anterioribus minoribus, aliisque quatuor parvis hemisphæricis, per paria longitudinaliter ordinatis. In margine laterali et angulis posticis puncta elevata pallida fere ocelliformia. *Coxæ posticæ* spinis externis apice recurvis. *Femora postica* spinosissima: spina elongata basis apice diffracta. *Abdomen* fere verticale, haud retractum, scabrum.

XXVIII. *A Description of several new Species of Insects collected in New Holland by Robert Brown, Esq. F.R.S. Lib. Linn. Soc. By the Rev. William Kirby, M.A. F.R. and L.S.*

Read February 17, 1818.

No country has produced more novelties in every department of Natural History than New Holland; and the plants and animals of that insular continent, if I may so speak, are most of them of a peculiar character. Even such as are most nearly related to those of other climates usually exhibit some diagnostic that separates them from their correlatives, and indicates the region that gave them birth. Thus, the *Rhipiceræ* of New Holland are distinguished from those of South America by the teeth that arm the inside of their mandibles: their *Lucani*, (*L. nebulosus* Kirby, at least,) from those of other countries by their recurved mandibles and emarginate mentum. Not to mention the differences that separate *Anoplognathus* from *Geniates* and *Rutela*, or *Scarabæus proboscideus* from its affinities *Sc. mobilicornis, quadridens*, &c.

Mr. Brown, (who has so ably illustrated the Flora of New Holland, and whose observations and discoveries have diffused so much new light over the science of Botany,) when in that country did not overlook its zoological productions, and amongst other subjects collected many new and singular species of insects. Desirous of having these treasures described, and his time and attention,—to the great benefit of the botanical world,—being devoted

voted to another science; though fully competent to the task himself, he has requested me to lay a description of them before the Linnean Society, which I shall now do to the best of my ability, adhering to the plan begun in my former paper.

COLEOPTERA PENTAMERA.

(*Buprestidæ.*)

BUPRESTIS Linn.

cruentata. 1. B. viridis, elytris subacuminatis violaceis: fasciis duabus, maculaque antica laterali, sanguineis.

PLATE XXIII. FIG. 1.

Long. corp. lin. 4.

Parva sed pulcherrima. *Corpus* lineare, subcylindricum, nitidum, punctulatissimum, glabrum, amœne viride. *Caput* triangulare, inter oculos impressum, postice canaliculatum. *Antennæ* capite vix longiores, nigræ. *Thorax* linea angustissima dorsali longitudinali lævi. *Scutellum* triangulare: disco excavato. *Elytra* striata: striis punctatis, violacea; fasciis duabus, anteriori subsinuata, postica lunata, maculaque sub humero cum fascia antica connexa, sanguineis. Inter fascias color violaceus elytrorum vergit in purpureum. Elytrorum apex subacuminatus.

tricolor. 2. B. viridi-aurata, elytris bidentatis, flavis: litura basis, sutura, fascia, maculaque apicis, violaceis.

Long. corp. lin. $5\frac{3}{4}$.

Corpus subdepressum, oblongum, punctulatum, subtus viridi-auratum: pube parva albida. *Caput* inter oculos impressum, postice canaliculatum. *Antennæ* nigræ. *Thorax* æneus: lateribus sordide flavis, postice paulo latior: puncto medio impresso. *Scutellum* triangulari-cordatum, viride: disco impresso.

Elytra

Elytra striata: striis punctatis; interstitiis punctis sparsis, sordide flava: litura laterali postice hamata basis, sutura late, fascia angulata pone medium, maculaque apicis subtriangulari, cum macula elytri alterius lunulam formante, purpurascente-violaceis, vel cruce obversa lunula coronata.

phæorhæa. 3. B. viridi-aurata, elytris bidentatis subsulcatis luteis, apice fusco-purpurascentibus.

PLATE XXIII. FIG. 2.

Long. corp. lin. $4\frac{2}{3}$.

Insectum elegans. *Corpus* lineari-oblongum, subdepressum, punctulatum, glabrum, nitidum, viridi-auratum. *Caput* canaliculatum. *Antennæ* viridi-æneæ. *Thorax* antice submarginatus, postice latior subtrilobus, utrinque puncto majori foveolaque dorsali impressus. *Scutellum* triangulare, viridi-auratum, disco impressum. *Elytra* subsulcata: sulcis punctatis; interstitiis sparse punctatis, obscuriuscula, pallide lutea, apice late fusco-purpurascentia, spinis duobus distantibus terminata.

rufipennis. 4. B. atra nitida, elytris bidentatis sanguineis: sutura nigra.

Long. corp. lin. 7.

Corpus lineari-oblongum, subdepressum, punctulatum, glabrum, nitidum, atrum. *Caput* inter oculos longitudinaliter impressum. *Thorax* sparse punctatus, postice sublobatus, utrinque obtusangulus; lateribus fovea profunde excavatis. Punctum impressum ante scutellum, et unum utrinque in ipso margine postico. *Elytra* striata: striis punctatis, sanguinea: sutura atra, apice bidentata: dentibus brevissimis approximatis.

decemmaculata. 5. B. sulphurea, elytris tridentatis atris: maculis quinque luteis, pedibus violaceis.

PLATE

PLATE XXIII. FIG. 3.

Long. corp. lin. 6.

Corpus lineari-oblongum, punctulatum, glabrum, obscuriusculum, subtus sulphureum. *Caput* nigro-æneum, inter oculos postice canaliculatum: antice macula lanceolata sulphurea. *Antennæ* nigræ. *Thorax* nigro-æneus: lateribus sulphureis, dorso obsolete canaliculatus, ante scutellum impressus. *Scutellum* triangulare, atrum: disco antice impresso. *Elytra* striata: striis punctatis, atra: maculis quinque luteis, prima nempe subrotunda ad scutellum, secunda oblonga laterali ad humeros, tertia transversa ante medium, quarta lunata pone medium, ultimo in apice subtriangulari minori, luteis. Apex ipse dentibus tribus parvis, intermedio longiori, armatus. *Postpectus* medio et lateribus macula nigra. *Pedes* violacei.

cuprifera. 6. B. supra nigro-ænea, rugulosa, elytris serrulatis: vitta laterali cupreo-aurata, margine violaceo.

Long. corp. lin. $5\frac{3}{4}$.

Corpus oblongum, depressum, subtus nitidum, viridi-æneum, punctulatum, parva pube pilosulum, supra minutissime rugulosum, nigro-æneum, obscuriusculum, glabrum. *Caput* inter oculos punctis impressis valde excavatis quasi reticulatum. *Antennæ* thoracis fere longitudine, filiformes, subserratæ. *Thorax* transversus, utrinque postice subimpressus. *Scutellum* minutissimum, apice rotundatum, lævissimum. *Elytra* acuta, a medio fere ad apicem minutissime serrulata: vitta laterali subflexuosa fulgide cuprea: margo ipse lateralis violaceus.

cupriceps. 7. B. viridi-aurata, elytris serratis punctato-striatis, capite cupreo, ano bispinoso.

Long. corp. lin. $5\frac{1}{2}$.

Corpus

Corpus lineari-lanceolatum, subdepressum, punctatum, nitidum, viridi-auratum. *Caput* obscuro-cupreum. *Antennæ* filiformes, æneæ, subserratæ. *Thorax* postice latior, puncto impresso ante scutellum. *Scutellum* subquadratum. *Elytra* seriatim punctata, basi impressa, a medio serrata, apice truncata, trispinosa. *Anus* spinis duabus minutis armatus.

fissiceps. 8. B. ænea, elytris integerrimis sericeis substriatis, basi lobatis, capite emarginato.

PLATE XXIII. FIG. 4.

Long. corp. lin. 4.

Corpus oblongum, subdepressum, æneum, subtus albido-pilosum. *Caput* inter oculos profunde impressum, quasi bifidum, in valleculæ fundo carinatum. *Antennæ* filiformes haud serratæ. *Thorax* lineolis plurimis dorso concentricis insculptus, postice lobatus: lobo truncato. *Scutellum* minutum acuminatum. *Elytra* striato-punctata: punctis quasi concatenatis, rugulis transversis minutissimis sericea, basi apud scutellum lobata: lobo rotundato.

(*Cebrionidæ.*)

RHIPICERA Latr.

femorata. 9. R. atra, thorace elytrisque punctis albis irroratis, femoribus rufis.

Long. corp. lin. 8.

Habitat in Australasiæ insulis dictis *Kent's Islands* in freto dicto *Bass's Straits.*

R. mystacinæ affinis. *Corpus* lineare, subcylindricum, nigrum, subtus pube albida incanum. *Caput* punctulatum, inter antennas impressum. *Antennæ* multiarticulatæ, atræ, flabellatæ: ramulis ultra 30 linearibus compressis elongatis, primis quatuor

tuor abbreviatis. *Mandibulæ* protensæ, primum divergentes, dein convergentes, intus bidentatæ: dentibus rotundatis, apice acutissimæ. *Thorax* brevis, subcylindricus, postice paulo latior, ante scutellum impressus, punctis difformibus piloso-niveis utrinque præcipue irroratus. *Scutellum* rotundatum, disco excavatum. *Elytra* punctata: lineis quinque longitudinalibus elevatis interiori postice dimidiata, punctis plurimis sparsis piloso-niveis variegata. *Femora* rufa, apice nigra.

(*Scarabæidæ.*)

Scarabæus Latr.

Juba. 10. S. thorace antice retuso subcornuto, clypeo reflexo cornu brevi recurvo, elytris castaneis cinereo-punctatis.

Long. corp. lin. 13.

Habitus fere *S. sylvani* Fabr., et *S. Ascanii* Kirby. *Corpus* oblongum, nitidum, subtus piceum, pubescens. *Caput* nigrum, confluenter punctatum, postice lævius. *Clypeus* reflexus, apice truncatus, cornu brevi punctato, subrecurvo, obtusiusculo armatus. *Thorax* niger, lævis, levissime attamen et sparse punctulatus: punctulis sine lente forti omnino inconspicuis, postice repandus, antice retusus: fovea parva; fundo ruguloso. Cornu parvum, brevissimum in ipso margine antico. *Elytra* castanea, subseriatim punctata: punctis excavatis pollinoso-cinereis. *Tibiæ* anticæ tridentatæ.

Bolboceras Kirby.

Labrum transversum.

Labium bipartitum: laciniis oblongo-quadratis.

Mandibulæ corneæ, supra concava, altera apice bidentata: dente interiori longiori acuto.

Maxillæ apice bilobæ: lobis ciliatis; interiori minuto, exteriori subcuneiformi: angulo apicis intus producto acutissimo.
Palpi filiformes.
Mentum subquadratum, integrum.
Antennæ undecim-articulatæ: articulo primo subclavato extus minutissimo, secundo cylindrico, proximis sex transversis, ultimis tribus clavam maximam compressam suborbiculatam, pilosam, articulo intermedio sæpius penitus tecto et abdito, formantibus.

GEOTRUPES Latr.

Labrum transversum, integrum.
Labium bifidum: lobis rotundatis.
Mandibulæ corneæ, arcuatæ, edentulæ, acutæ, supra concavæ.
Maxillæ lobo exteriori trigono, apice scopigero: scopa densa, rigida, trigona.
Palpi filiformes.
Mentum suborbiculatum, apice profunde emarginatum.
Antennæ undecim-articulatæ: articulo primo incrassato clavato piloso, secundo brevissimo sequentibus crassiori obconico, sex proximis magnitudine sensim crescentibus, ultimis tribus clavam subovatam obscuram papillosam, intermedio semper aperto, formantibus.

These two sets of characters are designed to point out the differences between two distinct families of *Scarabæidæ* that have hitherto been considered as belonging to the same genus. *Sc. mobilicornis* Linn. (of which *Sc. testaceus* Fabr. is only a variety), *quadridens* Linn., *farctus* Fabr., *Lazarus* Fabr., *Cyclops* Oliv. &c., belong to one of these families; and *Sc. Typhæus* Linn., *dispar* Fabr., *Momus* Fabr., *stercorarius* Linn., *foveatus* Marsh., *Mutator* Marsh., *splendidus* Fabr., *sylvaticus* Fabr., *hemisphæricus* Oliv., and *vernalis*

lis Linn., &c. to the other. Whoever considers these characters, and compares these sets of insects with each other, will be immediately convinced that, according to the modern system, they ought to constitute different genera. The mandibula of one side (in some the right-hand one and in others the left) bidentate at the apex; maxillæ with the outer lobe truncated at the apex, the inner angle acuminate, and narrowest at the base, and ciliated; the quadrate entire mentum; and above all the compressed, orbiculate, shining, punctate, hairy clava of their antennæ, the exterior lamellæ of which usually inclose the intermediate one as entirely as the valves of a bivalve shell the animal which inhabits it, distinguish the former of these tribes, to which I have long given the generic name of *Bolboceras*; whereas the other, the true *Geotrupes*, or earth-borer, is remarkable for mandibulæ without teeth; maxillæ with a prismatic exterior lobe terminating in a brush of stiff dense hairs; an orbicular deeply-emarginate mentum; labium with rounded lobes; and antennæ with a subovate clava, the third joint of which is always apparent, and all its joints exhibiting a downy appearance, but having no hairs. The body of the former also is more hemispherical than that of the latter, and the clypeus is not rhomboidal.

Geotrupes vernalis seems to connect these two genera; its body approaching to an hemispherical form; its labrum, though not emarginate, terminating in a concave line; and its mandibulæ having two teeth at the end. It differs from both in having the interior tooth the shortest, and the exterior edge of the mandible sinuate. In most other respects it agrees with *G. stercorarius*, &c. In *Bolboceras Cephus* the middle joint of the clava of the antennæ is not so wholly shut up between the two exterior ones as to be entirely hidden by them. In other respects it agrees with the rest. My details of *Bolboceras* were taken from *B. quadridens*,

and those of *Geotrupes* from *G. stercorarius*. I shall now describe a new species of the former genus from Mr. Brown's collection.

Australasiæ. 11. B. testaceus, thorace punctatissimo antice retuso, clypeo obtuse carinato.

PLATE XXIII. FIG. 5.

Long. corp. lin. 9.

Corpus oblongo-hemisphæricum, totum testaceum, subtus pubescens. *Caput* antice confluenter, postice sparse punctatum. *Clypeus* antice rotundatus, marginatus: margine subreflexo, supra carinatus; carina transversa, obtusa, utrinque abbreviata. *Mandibula* sinistra a tergo bidentata: dente exteriore obtuso. *Labrum* late emarginatum. *Palpi* articulo extimo elongato, sublanceolato. *Antennæ* clava magna, compressa, exacte orbiculata, nitida, punctata, lamella intermedia penitus clausa. *Thorax* transversus et fere lunatus, confluenter punctatissimus: dorso postice longitudinaliter læviori punctulis sparsis, utrinque obtusangulus et puncto ordinario majori impressus, antice retusus: fovea subtriangulari, prominentia obsoleta triplici. *Elytra* striata: striis ex punctis impressis crenatis. *Tibiæ* anticæ serratæ: serraturis nigris. Tibiarum *calcaria* longissima.

TROX Fabr.

spurius. 12. T. oblongus, scaber, subcinereus, elytris seriatim papillatis.

Long. corp. lin. 5.

Intermedius inter *Trogem* et *Melolontham*, et forsan proprii generis. *Corpus* oblongum, nigrum, glabrum, obscurum, punctis papillatis et centro oblongo eminentibus pallidis subcinereum et scabrum. *Caput* suborbiculatum, deflexum, inæquale: clypeo

peo reflexo antice subemarginato. *Os* concursu labri et menti omnino clausum: labio, mandibulis maxillis palpisque labialibus penitus tectis. *Palpi maxillares* articulo extimo præcedentibus majori, subarcuato, basi tenuiori. *Mentum* magnum, elevatum, dorso depressum, triangulari-cordatum. *Antennæ* novemarticulatæ: articulo primo subglabro longiori, secundoque brevi, clavatis, apice incrassatis; tertio graciliori, clavato; quarto brevissimo, subcylindrico; quinto et sexto subpateræformibus, transversis; clava lamellis tribus lanceolatis acutis. *Thorax* transversus, antice emarginatus, postice obsolete obtusangulus, lateribus rotundatis, dorso utrinque tri-impressus. *Elytra* punctis papillatis seriatim ordinatis, seriebus plurimis. *Tibiæ anticæ* obtuse tridentatæ.

Not being able to come at the trophi (*Instrumenta cibaria* Fabr.) of this insect, I cannot clearly ascertain whether it belongs to *Trox* or *Melolontha*. Its habit, stature, and closed mouth are nearly those of the former genus; but the first joint of the antennæ is not hairy as in that, its abdomen not vaulted and flat, and the anterior pair of tibiæ are not without teeth.

MELOLONTHA Fabr.

sericea. 13. M. viridis, supra sericea subtus piloso-incana, pedibus rufis, clypeo elongato emarginato.

Long. corp. lin. $5\frac{1}{2}$.

Affinis *M. aulicolæ* Fabr. et *M. aurulentæ* Kirby, sed distincta. *Corpus* oblongum, viride, sericeo-nitidum, subtus ex pilis albis decumbentibus incanum. *Caput* inclinatum, ex punctis confertis impressis quasi reticulatum. *Clypeus* elongatus, antice profunde emarginatus: margine omni reflexo. *Palpi maxillares* niveo-pilosi. *Maxillæ* basi apertæ, magnæ. *Mentum* obtriangulare. *Antennæ* pallide rufæ, decemarticulatæ: articulo secundo

secundo sequentibus longiori; clava fusca. *Oculi* septo ciliato: cilia nivea. *Thorax* subconicus, confluenter punctatissimus, dorso subcanaliculatus, lateribus subspinosis impressis. *Scutellum* acuminato-triangulare, lævissimum. *Elytra* subseriatim punctata: lineis duabus longitudinalibus elevatiusculis. *Pedes* rufi, niveo-pilosi. *Tibiæ anticæ* apice subsinuatæ, vix dentatæ. *Tarsi* unguiculis apice bifidis. *Abdomen* ventre valde convexo et fere gibbo.

CETONIA Fabr.

atropunctata. 14. C. olivacea, clypeo elongato bifido, elytris punctis sex vel octo atris.

Long. corp. lin. 12.

Habitat in Australasia. Apud Port Jackson a D. Brown in Mimosa lecta.

Corpus nitidum, olivaceum, supra glaberrimum, subtus pubescens. *Caput* deflexum, punctatum. *Clypeus* elongatus, apice bifidus: lobis obtusis, margine incrassatus. *Palpi* subclavati. *Thorax* triangularis, antice truncatus: angulis porrectis acutis, postice sublobatus: lobo emarginato, sparse punctatus: margine laterali incrassato, subrepando. *Scutellum* triangulare, lævissimum. *Elytra* punctata, at vix seriatim, punctis impressis, subrugosa, basi læviuscula: punctis tribus atris in triangulo obtusangulo ordinatis, uno minori semicirculari apud scutellum, altero majori extus in medio, tertio minori intus pone medium, rotundis. Apice mucronata sunt elytra: mucrone brevissimo. *Postpectus* in medio, et abdomen subtus segmentis quatuor primis, nigris. *Poststernum* porrectum, apice triangulare. *Coxæ anticæ* tuberculo parvo subtriangulari fusco prope apicem inserto. *Tibiæ anticæ* acute tridentatæ. *Tarsi* unguiculis duobus compressis, truncatis.

Var. β. elytris punctis octo atris. D. MacLeay.

Brownii.

Brownii. 15. C. castanea, capite, thoracis disco, scutello, pectoreque nigris, clypeo elongato bifido.

PLATE XXIII. FIG. 6.

Long. corp. lin. $13\frac{1}{2}$.

Habitat in Australasia, apud Port Jackson.

Corpus obovatum, glaberrimum, nitidum, læve. *Caput* atrum. *Clypeus* elongatus, bifidus: lobis divergentibus, utrinque impressus, margine incrassato. *Antennæ* castaneæ. *Thorax* vix a præcedente differt quoad figuram, sed anguli antici haud protensi et latera rotundata, levissime punctulatus, castaneus: margine antico et postico, et macula magna dorsali sublobata, atris. *Scutellum* triangulare atrum. *Elytra* levissime, ast seriatim, punctulata, castanea; basi humeris suturaque, atris: *Pectus* et *Postpectus* atra. *Pedes* atri: tibiis castaneis apice atris. *Abdomen* nigro-castaneum. *Anus* lineolis transversis insculptus.

Horum insectorum collectori Botanices Australasiæ elucidatori eximio, Ordinum plantarum Naturalium docto et lynceo extricatori D. R. Brown, S.R.S. Bibl. L.S. *hoc insectum ab illo lectum merito dicatur.*

brunnipes. 16. C. supra viridis, thoracis lateribus, punctisque duobus dorsalibus elytrorumque plurimis, albis, pedibus brunneis.

Long. corp. lin. $5\frac{3}{4}$.

Affinis admodum videtur *C. aulicæ* Fabr. sed multo minor et distincta: *Corpus* obovatum, subtus nitidiusculum, nigrum, pilosulum, polline pallido variegatum; supra viride, obscurum. *Caput* deflexum, punctatum, postice lunula interrupta pollinoso-alba. *Clypeus* apice emarginatus, subreflexus. *Palpi* cum antennis brunnei. *Thorax* quoad figuram fere ut in præcedente,

dente, sed latera obsolete obtusangula, et postice haud lobatus, ante scutellum tamen emarginatus: lateribus margine punctisque duobus dorsalibus distantibus pollinoso-albis, lineolis arcuatis sparsis insculptus. *Scutellum* elongatum, triangulare, læve: lineola utrinque pollinoso-alba. *Elytra* pone humeros sinuata, punctis lineolisque sparsis pollinoso-albis picta, lineolis, interdum duplicatis interdum figura ferri equini, insculpta: lateribus ante apicem, apiceque ipso, obscure brunneis. *Pedes* setosi, brunnei. *Tibiæ anticæ* acute tridentatæ. *Podex* rugosus: maculis quatuor, interioribus majoribus, pollinoso-pallidis. *Abdomen* subtus lineolis arcuatis setigeris insculptum.

COLEOPTERA HETEROMERA.

(*Tenebrionidæ.*)

ADELIUM Kirby.

caraboides. 17. A. nigrum, thorace postice utrinque angulato, elytris porcatis: porcis alternis catenulatis.

PLATE XXIII. FIG. 7.

Carabus porcatus apterus, ater, elytris striatis apice granulatis. *Fab. Ent. Syst. Em.* i. 147. 101.
Calosoma porculatum. Fab. Syst. Eleuth. i. 211. 3.

Long. corp. lin. 7⅓.

Facies omnino *Carabi* sed hujus generis. *Corpus* subdepressum, nitidum, glabrum, nigrum. *Caput* subtriangulare, ex punctis excavatis confluentibus postice rugosum, antice inter antennas transverse elevatum. *Antennæ* fere filiformes, thorace longiores. *Thorax* planiusculus, transversus, ex punctis impressis confluentibus valde rugosus, antice emarginatus, postice transversus: angulis lateralibus extantibus, subrecurvis, utrinque marginatus:

tus: margine explanato rotundato. *Scutellum* apice rotundatum, punctatum. *Elytra* porcata: porcis crenatis, alternis catenatis, vel ex punctis oblongis elevatis, ut in *Carabis* pluribus obtinet, constantibus.

Obs. Porci omnes in apice elytri interrupti sunt.

I did not discover that *Adelium caraboides* had been described by Fabricius till after the figures illustrative of this paper were drawn; and as the insect here given confirms the genus I had laid down in my former paper, and is another instance of its species imitating the form and appearance of the *Carabidæ*, I think it may be interesting to Entomologists, particularly on account of Mr. Curtis's excellent figure, if I retain it. I have altered Fabricius's trivial name, as the insect certainly is neither a *Carabus* nor a *Calosoma*, to make it harmonize with those of the species before described.

HELÆUS Latreille.

* Thorace antice bipartito, ante caput protenso.

Brownii. 18. H. ater, glaberrimus, thorace caput ambiente, coleoptris disco elevato granulato: sutura carinata.

PLATE XXIII. FIG. 8.

Long. corp. lin. 9.

Affinis *H. perforato* Latr. sed dimidio minor. *Palpi maxillares* articulo extimo minori, subpetiolato. *Coleoptra* glaberrima, haud punctata, granulis quibusdam subseriatim notata. *Sutura* in carinam elevata. *Sternum* vix carinatum. Alias simillimus.

This family of the genus *Helæus* presents some of the most singular insects in nature. The lobes of the thorax meet over the

head, and by their union, by means of a sinus cut out of their inner side, form a round hole where the vertex of the head appears and part of the eyes, so that the animal is thus enabled to see things above it as well as below it. The anterior part of the head is below the thorax.

** Thorace haud caput ambiente.

piceus. 19. H. fusco-piceus glaber, thorace emarginato, elytris seriatim punctatis.

Long corp. lin. $6\frac{2}{3}$.

Forsan ad aliud genus amandandum. *Corpus* oblongo-ovale, totum glaberrimum, obscuriusculum, fusco-piceum. *Caput* postice angustius, levissime punctulatum. *Labrum* transversum, apice rotundatum. *Labium* transversum, rotundatum. *Mentum* fere pentagonum. *Palpi* maxillares quadriarticulati: articulo extimo magno, sed haud maximo, securiformi. *Clypeus* apice subemarginatus. *Thorax* semicircularis, segmento circuli antice dempto, postice subrepandus: lateribus marginatis, levissime punctulatus; dorso valde convexo. *Elytra* seriatim punctulata, marginata: margine subreflexo. *Epipleura* lata, lævis.

COLEOPTERA TETRAMERA.

(*Curculionidæ.*)

EURHINUS Kirby.

muricatus. 20. E. niger, piloso-subincanus, elytris basi subcristatis: granulis tuberculisque acutis elevatis scabris.

Long. corp. (Rostro excluso) lin. 8.

Corpus obcuneiforme, plus minus piloso-incanum. *Caput* rugulosum, postice læve, inter oculos canaliculatum. *Rostrum* thoracis

thoracis longitudine, pone antennas punctatum. *Antennæ* rostro pone apicem insidentes, thoracis fere longitudine, basi vix moniliformes: articulis tribus primis subclavatis, proximis quinque obconicis, sensim brevioribus et majoribus, ultimis tribus fere ut in *E. lævigori* K. *Thorax* teretiusculus, rugosus. *Coleoptra* oblonga, granulata, striata: striis punctatis; punctis profunde excavatis; dorsalium interstitiis tuberculorum acutorum serie, apud scutellum utrinque crista obsoletius elevata tuberculis acutis muricata. *Pedes* antici longiores: femoribus incrassatis.

CURCULIO Linn.

mirabilis. 21. C. fuscus, rostro brevissimo, thorace confertim elytrisque seriatim nodulosis, ventre masculo postice aperto.

PLATE XXIII. FIG. 9.

Long. corp. (Rostro excluso) lin. 10.

Corpus lineari-oblongum, obscurum, nigro-fuscum. *Caput* squamulis luteo-pallidis consitum. *Rostrum* brevissimum, crassissimum, subcylindricum, supra inæquale, canaliculatum, apice emarginatum. *Mandibulæ* maximæ, subtrapeziformes, intus lævissimæ, glaberrimæ, nitidissimæ, extus pallido-squamulosæ: pilis nigris intermixtis; vertice extus excavatæ. *Antennæ* fractæ: articulis 4^0, 5^0, 6^0, 7^0 globosis, quatuor ultimis clavam lanceolato-rhomboidalem acutam arctissime imbricatam et fere subsolidam formantibus. *Thorax* depressus, suborbiculatus, dorso subimpressus, antice subconstrictus, confertissime nodulosus. *Elytra* subporcata, seriatim nodulosa: nodulis parvis setigeris, apice obtusa et ad suturam submucronata. *Femora* inermia. *Tibiæ* vix calcaratæ. *Venter* segmentis duobus ultimis ut videtur quasi circulo dempto, adeo ut patent interiora;

sed revera deflexa est horum segmentorum pars media. Ex fundo cavitatis laminæ duæ, latæ, compressæ, obcuneatæ, apice rotundatæ, lævissimæ, glaberrimæ, nitidæ emergunt, et postice utrinque in margine ipso circuli setarum rigidissimarum fasciculi, vel potius pectines duo. Basi late excavatus est venter.

Var. Sexus alter: mandibulis trigonis obscuris, rugosis setosis, acutis, thorace vix impresso, ventre integro: cavitate nulla.

I know no insect amongst the *Curculionidæ* (except one of the same tribe with this in Mr. MacLeay's cabinet with an anal forceps, something like that of an earwig,) that is so wonderfully formed as the species here described. The ventral cavity, laminæ, and pecten have no parallel that I am aware of in the insect world. These organs are probably for sexual purposes, since the other sex, if I am not mistaken in supposing the variety I have described merely sexual, is without them.

(*Cerambycidæ.*)

STENOCORUS Fabr.

punctatus. 22. St. piceus, thorace spinoso, elytris excavato-punctatis, pallido nebulosis.

Long. corp. lin. 14.

Corpus lineare, subdepressum, piceum, nitidum, subtus piloso-incanum. *Caput* subinclinatum, subtus transverse rugosum: gula in medio lævissima, supra subpilosum postice rugosum, inter antennas canaliculatum. *Labrum* transversum: disco depresso. *Labium* bilobum: lobis divaricatis pilosis. *Mandibulæ* incurvæ, acutæ, supra rugosæ. *Maxillæ* apertæ: lobo exteriori elongato scopigero, interiori brevi ciliato. *Palpi* articulo extimo semicordato, *maxillares* longiores. *Mentum* transversum,

versum, apice rotundatum. *Antennæ* breviores, rufo-piceæ; articulis quinque intermediis extus apice spina armatis. *Thorax* rugosus, utrinque spina acuta valida, antice et postice constrictus, dorso verrucis s. tuberculis quinque, in quincunce ordinatis, complanatis. *Scutellum* piloso-cinereum. *Elytra* excavato-punctata: punctis magnis profundis, piceo pallidoque varia, apice bispinosa. *Pedes* dilute picei.

Distichocera MacLeay.

Labrum transversum, tetragonum.
Labium membranaceum, apice bilobum: lobis divaricatis.
Mandibulæ trigonæ, edentulæ, apice incurvæ, acutæ.
Maxillæ basi apertæ.
Palpi filiformes.
Mentum transversum, trapeziforme.
Antennæ sensim crassiores, disticho-ramosæ.

This genus, named long ago, as above, by Mr. MacLeay, connects *Cerambyx* with *Molorchus*, *Necydalis*, and *Rhagium*. With the latter indeed it has little other connexion than from the similar shape of its elytra, which grow gradually narrower towards the apex; from *Cerambyx* it is distinguished by its antennæ; and from *Molorchus* and *Necydalis* by its elytra, scarcely at all shorter than the wings, and by its disticho-ramose antennæ.

maculicollis. 23.

Plate XXIII. Fig. 10.

Long. corp. lin. 8.

Corpus fere cuneiforme, subtus pilis argenteis nitidum, supra nigrum, obscurum. *Caput* subcordatum, pilosum, canaliculatum, utrinque ante antennas carinatum. *Oculi* brunnei. *Antennæ* breviores, nigræ: articulis omnibus apice biramosis (duobus primis brevissime); ramis oppositis compressis vertice rotundatis,

tundatis, sinistris paulo longioribus, articulo extimo simplici clavato. *Thorax* subcylindricus: maculis quatuor dorsalibus quadratim ordinatis. *Elytra* cuneiformia: lineis tribus longitudinalibus elevatis; striga apud scutellum et alia majori in medio apud suturam, piloso-argenteis, apice truncata. *Femora* brunnea. *Tibiæ* bicalcaratæ. *Alæ* elytris longiores.

MOLORCHUS Fabr.

cingulatus. 24. M. niger, elytris dimidiatis luridis, apice macula alba, abdomine cingulis tribus niveis.

Long. corp. lin. 11.

Corpus lineare, subtus atrum, pilis albis maculosum. *Caput* inclinatum, subcordatum, medio canaliculatum, utrinque sub antennis carinatum, ex punctis confluentibus rugulosum. *Clypeus* a fronte linea impressa separatus, pentagonus, vel rhomboidalis: angulo antico truncato. *Antennæ* mediocres, apicem versus crassiores, nigræ. *Thorax* brevis teretiusculus, antice constrictus, postice impressus, lateribus caput versus obtusangulis, confluenter punctulatissimus. *Scutellum* nigrum. *Elytra* brevissima, oblique truncata, confluenter punctulata, lurida: lateribus deflexis fuscescentibus, apice in medio macula triangulari pilosa alba. *Alæ* nigricantes, corporis longitudine. *Pedes* brunnei: femoribus dilutioribus. *Abdomen* cingulis tribus piloso-niveis circumcinctum.

(*Lepturidæ.*)

LEPTURA Linn.

ceramboides. 25. L. nigra, thorace subspinoso antice constricto, elytris croceis, ore pedibusque rufis.

PLATE XXIII. FIG. 11.

Long. corp. lin. 7¾.

A habitu

A habitu generis omnino recedit, *Cerambycibus* propior. *Corpus* lineare, angustum, nitidum, glabriusculum, nigrum. *Caput* porrectum, oblongiusculum, subtus et antice rufum, inter oculos canaliculatum, ante antennas declive. *Labrum* transversum, minutum. *Labium* apice bifidum: lobis divaricatis. *Mandibulæ* trigonæ, subforcipatæ; acutæ. *Maxillæ* basi apertæ. *Palpi* breves, filiformes. *Mentum* transversum, quadrangulum. *Antennæ* submediocres: articulis intermediis subtus barbatis. *Oculi* subtriangulares, prominuli. *Thorax* antice valde angustatus et late constrictus, utrinque subspinosus, supra quadrituberculatus: tuberculis complanatis, anticis approximatis. *Elytra* punctulatissima, obscura, elevato-quadrilineata, crocea: sutura in medio violacea. *Pedes* rufi.

This species approaches very near to *Stencorus suturalis* of Olivier (iv. no. 69. 29. 25. *t.* 3. *f.* 29.); but in his insect the legs are black, the thorax has only two tubercles, and the base of the exterior margin as well as that of the suture is violet; whereas in *L. ceramboides* the legs are red, the thorax has four tubercles, and only the suture is violet. His insect also comes from a different country, being a native of the East Indies. These two species form a distinct section of *Leptura*, or perhaps a new genus.

(*Chrysomelidæ.*)

CHRYSOMELA Linn.

Curtisii. 26. C. oblonga, sanguinea, thoracis vitta, elytrisque disco, aurato-viridibus.

PLATE XXIII. FIG. 12.

Long. corp. lin. 4.

Corpus oblongum, sanguineum. *Caput* punctulatum. *Antennæ* extrorsum crassiores, compressæ, nigræ, basi rufæ. *Thorax* transversus,

versus, punctatus, antice utrinque puncto vittaque dorsali angusta cyaneo-viridibus. *Scutellum* viride. *Elytra* vage punctata: disco aurato-viridi. *Postpectus* utrinque viride. *Pedes* genubus tarsisque nigris.

Ab insectorum pictori eximio, collectori strenuo, indagatori assiduo, cordato, D° Johanni Curtis Norvicensi, *hoc pulchellum insectum nomen mutuatur.*

HEMIPTERA.

(*Cimicidæ.*)

SCUTELLERA Lam.

Dux. ♀. S. viridis, supra cyanea, scutello basi macula biloba, abdomine, lateribus, femoribusque, aurantiacis.

Long. corp. lin. 6.

Corpus ex ovali subheptagonum, viride, punctulatum. *Caput* triangulare, subtus gula flava utrinque puncto nigro. *Rostrum* nigrum, basi rufum. *Antennæ* nigræ. *Thorax* antice lævis viridis: lineola transversa obscura rufa, postice convexus cyaneus punctulatus utrinque obtusangulus. *Scutellum* cyaneum: antice macula magna transversa postice biloba aurantiaca. *Postpectus* cyaneo maculatum. *Alæ* nigræ. *Pedes* villosi, cyanei: femoribus rufis. *Abdomen* lateribus dentato-aurantiacis.

(*Cicadiadæ.*)

ACHĪLUS Kirby.

Frons tricarinata.

Labrum vix distinctum, cum clypeo in medio coalitum.

Antennæ suboculares biarticulatæ: articulo primo brevissimo cylindrico, secundo paulo crassiori tereti, lævi, setigero.

Thorax brevissimus, antice subrepandus, postice obtusangulus: angulo caput spectante.

The

The situation of the antennæ of the insect from which I have formed this genus, agrees with that of *Fulgora*; but in all the genuine species of the latter their second joint is much larger than the first, globose, and covered with papillæ: whereas in *Achīlus* it is not remarkably larger than the first, is rather tapering, and without papillæ. The labrum also is not separated from the clypeus, except on the sides, by any suture or even impressed line; the thorax a good deal resembles that of *Fulgora*, but it is more completely obtusangular.

flammeus. 28. A.

PLATE XXIII. FIG. 13.

Long. corp. lin. 6.

Corpus sanguineum, immaculatum. *Caput* vertice transverso quadrangulo, postice segmento circuli dempto. *Frons* inflexus, vix a clypeo separatus, tricarinatus. *Clypeus* cum labro in medio connatus. *Oculi* hemisphærici, albi, laterales, postici. *Antennæ* sub oculis insertæ, biarticulatæ: articulo primo brevissimo cylindrico, secundo longiori paulo crassiori teretiusculo, haud papillato, setigero. *Ocellus* utrinque intus inter oculos et antennas ad clypeum situs. *Thorax* brevis, postice sinuatus: sinu magno obtusangulo, antice repandus. *Metathorax* cum *Scutello* fere rhomboidalis. *Elytra* corpore longiora, plana, oblonga, latere exteriori et apice rotundata, intus subsinuata. *Alæ* plicatiles, elytris paulo breviores, apice latiores obliquæ rotundatæ. *Pedes* angulati: tibiis posticis apice calcaribus et spinulis semicoronatis. *Anus* flosculiferus*.

* By this term we designate an anus terminated by a process resembling a floret. Ex. *Fulgora candelaria*.

HYMENOPTERA.

(*Sphegidæ.*)

THYNNUS Fabr.

annulatus. 29. T. fulvescente-villosus, thorace obscure ferrugineo nigro maculoso, abdomine flavo: segmentis utrinque annulo nigro.

Long. corp. lin. 15½.

Corpus nigrum, pube densa satis fulvescenti vestitum. *Caput* subtriangulare: ore flavo. *Clypeus* flavus, postice macula dorsali longitudinali subcampanulata nigra. *Antennæ* nigræ. *Truncus* oblongus, quadrangulus, fulvus: maculis quibusdam obscuris dorsalibus nigris. *Pedes* fulvi: coxis posterioribus basi nigris. *Alæ* corporis fere longitudine, fuscescentes. *Abdomen* linearilanceolatum, basi retusum, apice deflexum, flavum: segmentis apice annulisque duobus latere exteriori interruptis, nigris. *Podex* macula nigra. *Venter* segmentis utrinque lunula, strigaque intermedia, nigricantibus; ultimo spina acuminata armato.

variabilis.* 30. T. rufus, nigro maculosus, abdomine atro: segmentis quinque anticis supra et infra flavo maculatis.

Long. corp. lin. 13.

Corpus fere lineare, mollissime sed vix dense fulvo pubescens. *Caput* flavum: vertice macula magna angulata nigra. *Antennæ* thoracis fere longitudine, setaceæ, nigræ. *Truncus* subglobosus, supra fulvus: antice fasciis duabus vitta intermedia connexis,

* I adopt this name from the MSS. of Dr. Leach, who observes that this species varies considerably. He possesses four varieties, and Mr. MacLeay a fifth.

nigris,

nigris, disco nigro: lineolis duabus obliquis rufis, subtus fulvus, spatio inter pedes primi paris et posteriores nigro utrinque fulvo strigoso. *Pedes* rufo-fulvi. *Alæ* corpore longiores fuscescentes. *Abdomen* ovato-lanceolatum, vel fere cuneiforme, nigrum, segmento primo flavo: apice, maculis duabus, cruceque, nigris, intermediis quatuor nigris: maculis quatuor flavis transverse digestis. *Venter* segmentis anticis fascia flava, ultimis interruptis, anali mucronato.

(*Apidæ.*)

XYLOCOPA Latr.

Australensis. 31. X. cyanea, supra viridis, alis violaceis, capite anoque villoso-albis.

Long. corp. lin. 8.

Corpus oblongum, subtus cyaneum: pube nigra. *Caput* orbiculatum, viride: vertice cyaneo tincto, totum villoso-album. *Antennæ* nigræ, subtus piceæ: stipite viridi-æneo. *Truncus* supra cyaneo-viridis, punctulatus: disco lævissimo nitido, antice canaliculatus. *Alæ* violaceæ. *Pedes* cyanei atro hirti, tarsi postici præcipue. *Abdomen* supra viride, punctatum, nitidum: ano pilis albis ciliato.

(*Formicidæ.*)

FORMICA Linn.

intrepida. 32. F. nigra, trunco pedibusque rufis, capite abdomine majori.

Long corp. lin. 7.

Habitat in Australasia, apud Port Jackson. Formicarum audacissima, strenuissima.

Affinis *F. rufæ*, L. *Corpus* glabriusculum, nigrum. *Caput* triangulare, postice subemarginatum, supra sparse punctatum, et in-

super

super sub lente forti reticulato-lineatulum: areolis minutissimis. *Stemmata* in triangulo in foveolis inserta, sed posteriora duo difficillime cernuntur. *Frons* inter antennas bicarinata: carinulis flexuosis; interstitio canaliculato. *Mandibulæ* validissimæ, supra punctatæ, apice sexdentatæ. *Antennæ* rufescentes: stipite nigro. *Clypeus* obtuse carinatus, emarginatus. *Truncus* compressus, cum pedibus rufus; femoribus dilutioribus. *Squama* rufa, integra, pilis subciliata. *Abdomen* subovale, nigrum, subpilosum.

viridis. 33. F. glauco-viridis: antennis oreque rufis, abdomine segmentis margine albis.

Long. corp. lin. .

Habitat in Australasia septentrionali.

Affinis videtur *F. smaragdinæ* Fabr. sed minor. *Corpus* fere glaucum, pube brevissima obscuratum. *Caput* triangulare. *Mandibulæ* apice nigræ, supra punctatæ. *Labium* cum *maxillis* pallidum. *Frons* stemmatibus tribus in triangulo. *Antennæ* pallide rufæ. *Clypeus* truncatus. *Truncus* subglobosus dorso saturatior, subtus utrinque macula obscura pallida. *Tarsi* rufescentes. *Alæ* corpore longiores, albæ: neuris fuscis. *Squama* brevissima, crassa, emarginata. *Abdomen* ex globoso ovatum, glaucum: segmentis supra et infra margine albis.

This is the ant the bite of which Sir Joseph Banks found so painful*.

* Hawkesworth's *Cook's Voy.* iii. 223. Kirby and Spence, *Introduct. to Entomology*, i. 3rd ed. 123.

EXPLA-

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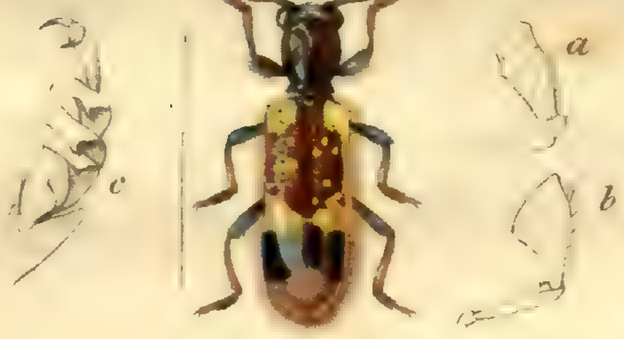

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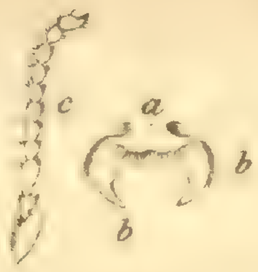

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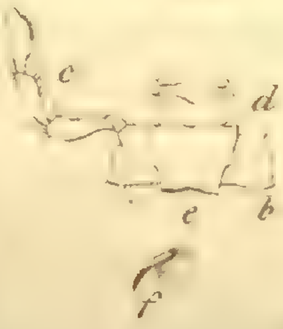

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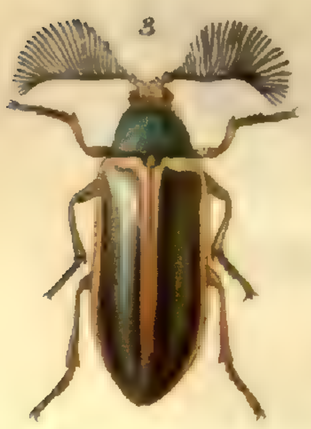

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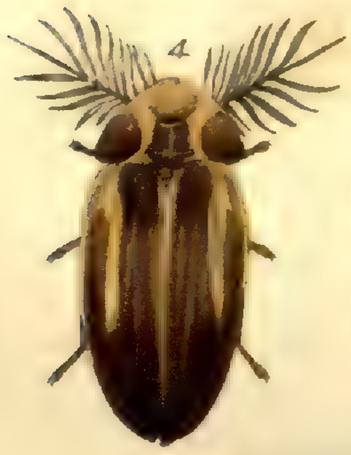

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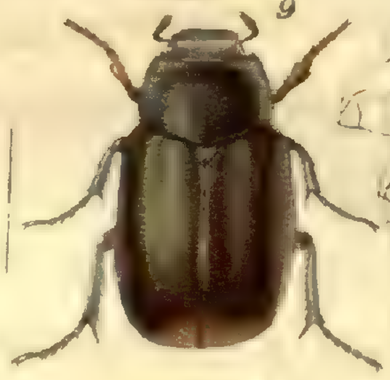

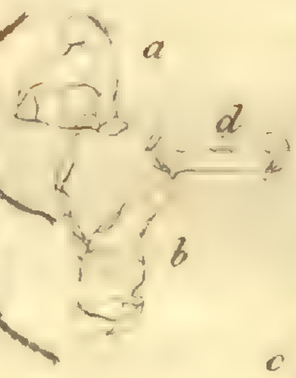

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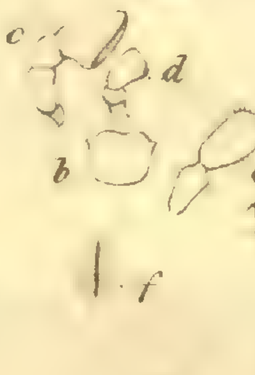

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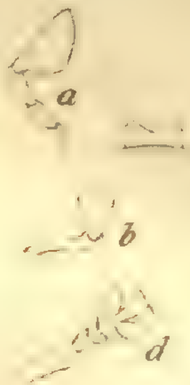

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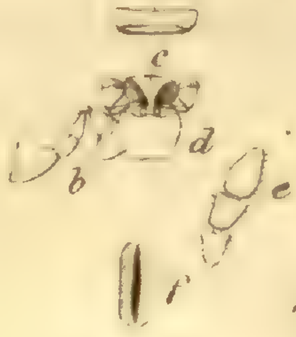

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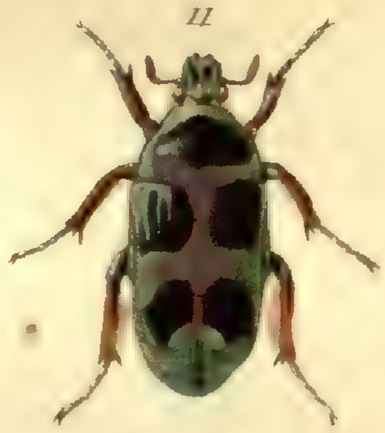

J. Curtis ad nat. rem. e. sculp.

EXPLANATION OF PLATES XXI. XXII. XXIII.

Plate XXI.

Fig. 1. *Pelecium cyanipes.*
a. Labrum. *b*. Maxillary Palpus. *c*. Labial ditto. *d*. Li-
gula. *e*. Antenna.

2. *Anelastes Drurii.*
a. Clypeus. *bb*. Mandibulæ. *c*. Antenna.

3. *Rhipicera marginata.*
aa. Mandibulæ. *bb*. Ditto of *Rh. femoralis.*

4. *Lampyris Latreillii.*
a. Antenna of female.

5. *Eurypus rubens.*
a. Maxillary Palpus. *b*. Labial ditto. *c*. Labrum. *d*. Tarsus.

6. *Axina analis.*
a. Maxillary Palpus. *b*. Labial ditto. *c*. Tarsus.

7. *Priocera variegata.*
a. Maxillary Palpus. *b*. Labial ditto. *c*. Tarsus.

8. *Geniates barbatus.*
a. Mandibulæ. *b*. Maxilla with Maxillary Palpus. *c*. Labrum. *dd*. Labial Palpi. *e*. Labium. *f*. Mentum with circular beard or brush. *g*. Antenna. *h*. Dilated anterior Tarsus.

9. *Apogonia gemellata.*
a. Mandibula. *b*. Maxilla with Maxillary Palpus. *c*. Labrum. *d*. Labium with Labial Palpi. *e*. Antenna. *f*. Part of Tarsus.

10. *Rutela pulchella.*
a. Mandibula. *b*. Maxilla with Maxillary Palpus. *c*. Labrum. *d*. Labium with Labial Palpi. *e*. Antenna.

Fig. 11. *Cetonia MacLeayi.*

12. *Lucanus nebulosus.*

a. Maxilla with Maxillary Palpus. *b*. Labium with Labial Palpi. *c*. Mentum.

13. *Psammodes longicornis.*

a. Labrum. *b*. Base of Maxilla. *c*. Maxillary Palpus. *d*. Labium with Labial Palpi. *e*. Mentum. *f*. One of the setigerous puncta of the Thorax.

14. *Scotinus crenicollis.*

a. Labrum. *b*. Base of Maxilla. *c*. Labium. *d*. Maxillary Palpus. *e*. Mentum. *f*. Antenna.

15. *Sphærotus curvipes.*

a. Labrum. *b*. Mentum. *c*. Maxillary Palpus. *d*. Labial ditto. *e*. Apex of Antenna. *f*. One of the puncta of the Elytra.

16. *Strongylium chalconatum.*

a. Labrum. *b*. Base of Maxilla with Maxillary Palpus. *c*. Labium with Labial Palpi. *d*. Mentum. *e*. Apex of Antenna. *f*. One of the puncta of the Elytra.

Plate XXII.

Fig. 1. *Eurynotus muricatus.*

a. Labrum. *b*. Labium. *c*. Mentum. *d*. Antenna.

2. *Adelium calosomoides.*

a. Labrum. *b*. Labium with Labial Palpus. *c*. Base of Maxilla with Maxillary Palpus. *d*. Mentum. *e*. Apex of Antenna. *f*. Anterior Tarsus.

3. *Oxura setosa.*

a. Labrum. *b*. Labium. *c*. Mentum. *d*. Mandibula. *e*. One of the setigerous puncta of the Thorax.

Fig.

Linn. Trans. Vol. XII. Tab. 22 p. 480

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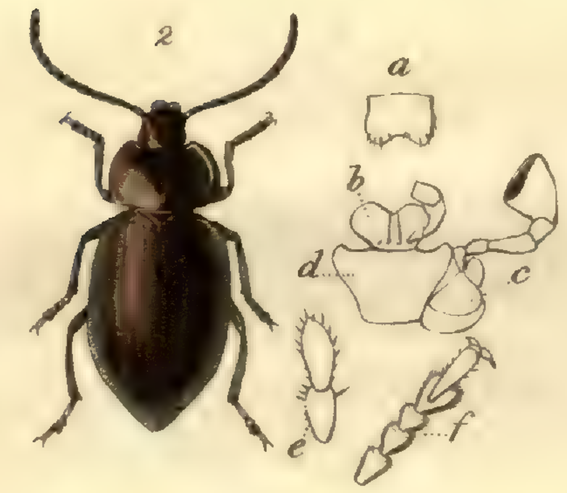

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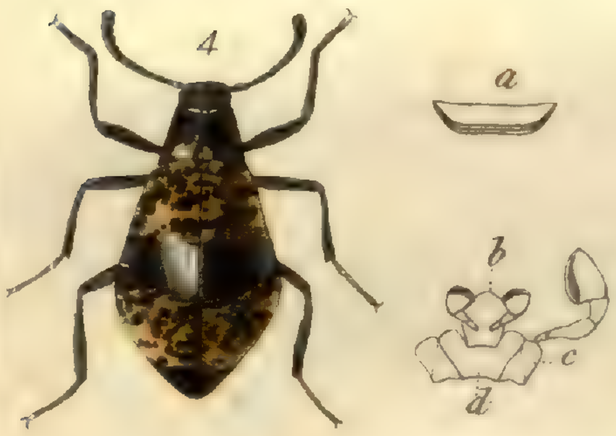

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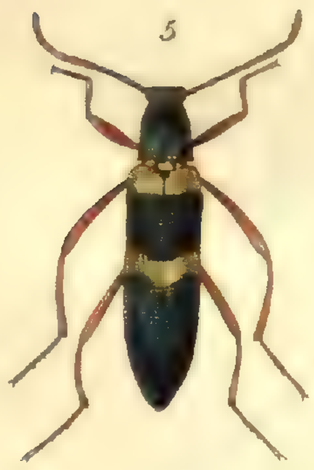

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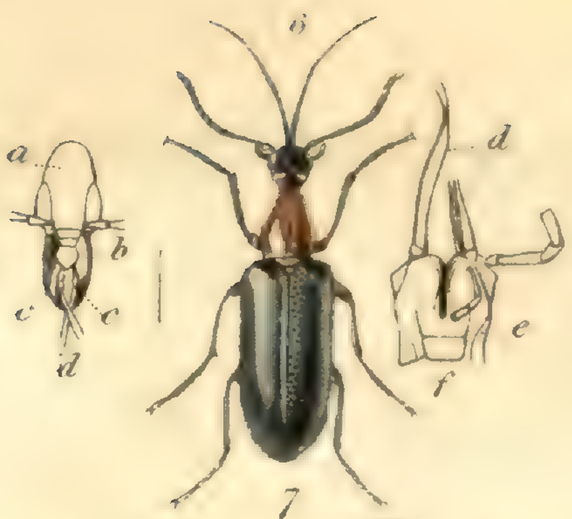

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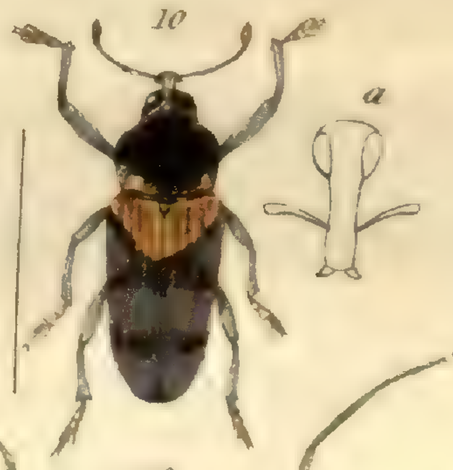

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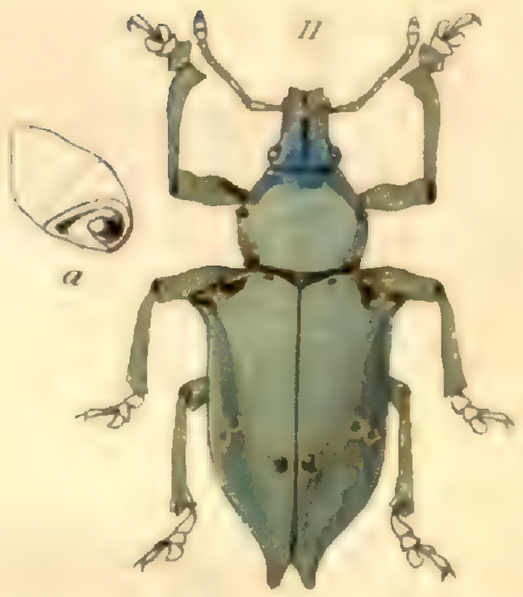

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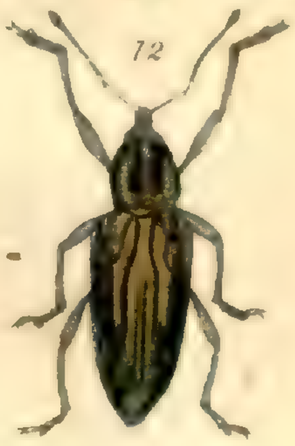

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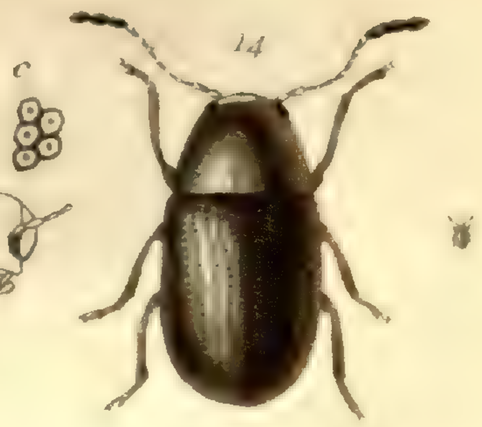

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J. Curtis ad nat pinx et sculp.

Fig. 4. *Spheniscus erotyloides.*

a. Labrum. *b*. Labium with Labial Palpi. *c*. Base of Maxillæ with Maxillary Palpus. *d*. Mentum.

5. *Stenochia rufipes.*

a. Labrum. *b*. Labium with Labial Palpus. *c*. Base of Maxilla with Maxillary Palpus. *d*. Mentum.

6. *Gnathium Francilloni.*

a. Head (front view). *b*. Labrum. *c*. Mandibulæ. *d*. Lobes of Maxillæ. *e*. Labium. *f*. Mentum.

7. *Rhinotia hæmoptera.*

a. Mandibulæ. *b*. Labium with Labial Palpi. *cc*. Maxillæ with Maxillary Palpi. *d*. Mentum.

8. *Eurhinus lævior.*

a. Mandibulæ. *b*. Labium with minute Labial Palpi. *cc*. Maxillæ with Maxillary Palpi. *d*. Mentum. *e*. Antenna ♂. *f*. Antenna ♀ of another species.

9. *Rhinaria cristata.*

a. Head (front view). *b*. Crest. *c*. Mandibula. *d*. Labium.

10. *Rynchænus Dufresnii.*

a. Head (front view).

11. *Curculio Hancocki.*

a. Apex of Mandibula.

12. *Curculio elegans.*

13. *Prionus Spencii.*

14. *Choragus Sheppardi.*

a. Head (front view). *b*. Palpi. *c*. Puncta of the Thorax.

15. *Lamprosoma bicolor.*

a. Labrum. *bb*. Mandibulæ. *c*. Maxillary Palpus. *d*. Labial ditto. *e*. Antenna.

16. *Gonyleptes horridus.*

a. Mandibula with Chela. *b*. First joint of ditto. *c*. Part of Pectus. *d*. Sternum.

PLATE

Plate XXIII.

Fig. 1. *Buprestis cruentata.*
2. ——— *phæorhea.*
3. ——— 10-*maculata.*
4. ——— *fissiceps.*
5. *Bolboceras Australasiæ.*
a. Labrum. *b.* Mandibulæ. *c.* Labium with Labial Palpus. *d.* Maxilla with Maxillary Palpus. *e.* Mentum*. *f.* Antenna.
6. *Cetonia Brownii.*
7. *Adelium caraboides.*
8. *Helæus Brownii.*
9. *Curculio mirabilis.*
a. Ventral Cavity and Apparatus. *b b*, *c c.* Laminæ in ditto.
10. *Distichocera maculicollis.*
a. Labium. *b.* Antenna.
11. *Leptura ceramboides.*
12. *Chrysomela Curtisii.*
13. *Achilus flammeus.*
a. Front. *b.* Antenna.

* *c d e* are from *Bolboceras quadridens.*

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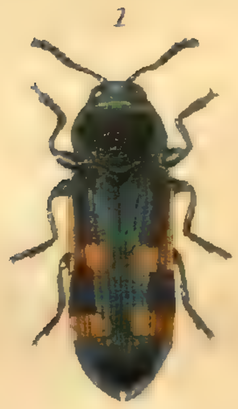

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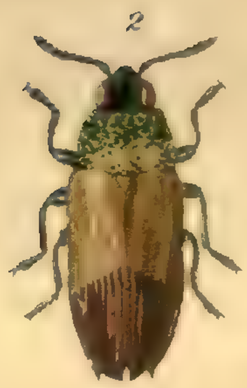

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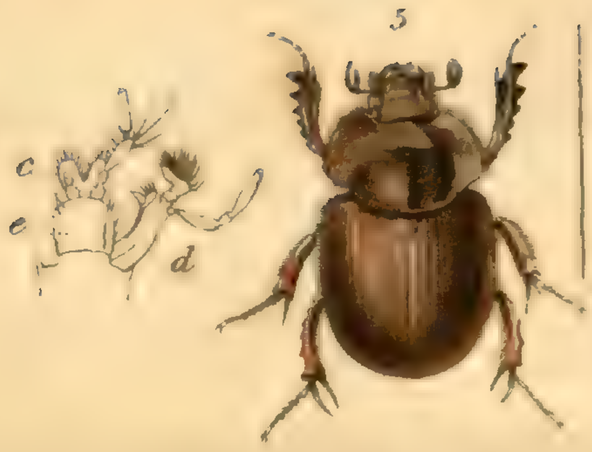

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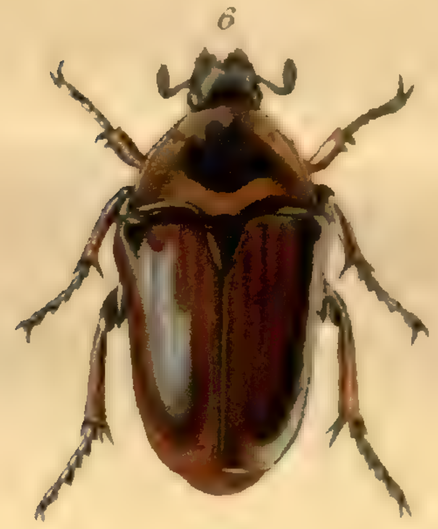

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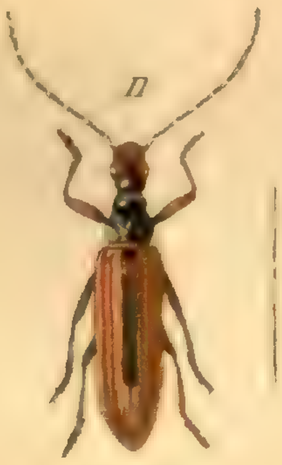

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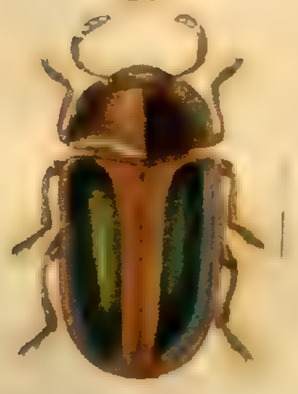

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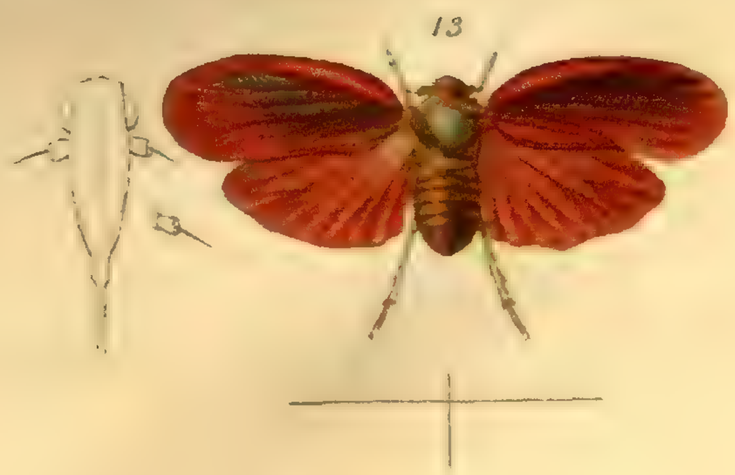


J. Curtis ad. nat. pinx. et sculp.

XXIX. *Some Account of the Island of Tristan da Cunha and of its Natural Productions. By Captain Dugald Carmichael, F.L.S.*

Read December 16, 1817.

The British Government having judged it expedient to take possession of the island of Tristan da Cunha, a military detachment, consisting of about fifty men, with a captain, two subalterns, and a medical officer, was sent to occupy it from the Cape of Good Hope. Motives of curiosity led me to apply for permission to accompany this expedition, which embarked on board His Majesty's ship Falmouth on the 2d of November 1816. A liberal supply of agricultural instruments, with a team of labouring oxen, and some cattle for breeding, was sent on board at the same time. We sailed from Table Bay on the 3d, and two days after encountered a heavy gale, during which, our cattle, standing unsheltered upon deck, were so much injured by the rolling of the ship, and by the sea washing over them, that they all died before we arrived at our destination. The westerly winds, which usually prevail in the high southern latitudes, protracted our voyage to the 28th of November: but we had the good fortune to come to anchor in fine weather, and landed all the stores without loss or damage.

Tristan da Cunha is situated in 37° 6′ south lat. and in 11° 44′ west long. The whole island is apparently a solid mass of rock in the form

of a truncated cone, rising abruptly from the sea, and ascending at an angle of 45 degrees to the height of three thousand feet. This mass is surmounted by a dome upwards of five thousand feet high, on the summit of which is the crater of an old extinguished volcano.

The island is of a circular form, and about nine leagues in circumference. In various places the sea beats home against the salient angles of the mountain, rendering it impossible to walk round the island. Between those points a narrow beach has been formed, by the gradual accumulation of the fragments of rock daily precipitated from above; and is covered in some few places with a layer of fine black sand resembling gunpowder, which is, however, kept in constant motion, being washed away by one gale, and cast up again by the next.

The face of the mountain, as far up as the base of the dome, is mostly covered with brush-wood, intermixed with fern and long grass, which veil its native ruggedness. In many parts, however, it is completely bare, and presents to view the edges of a vast number of strata arranged horizontally, or at slight degrees of inclination. These strata are in general from five to ten feet in thickness, and vary essentially in their internal structure. The greater number are of solid rock, of a blueish-gray colour and extreme hardness, in some instances homogeneous, in others exhibiting crystals of hornblende, felspar, and olivin sparingly scattered, or forming more than a moiety of the compound mass. Between those are frequently interposed beds of scoria cohering from the effect of partial fusion; of tufa studded with crystals of augite; or of ashes condensed by the pressure of the superincumbent mass. The latter, still retaining in a great measure their friable nature, moulder gradually away, and leave the more compact strata in projecting shelves.

The

The mountain appears to have been rent asunder by some violent convulsion, and the fissures filled up by a hard stony mass of a blueish or a reddish colour, and of the nature of trap, forming regular veins, the ramifications of which can be traced by the eye to a great height in the face of the rock. The sides of these veins, where they come in contact with the rock, are invariably in a semivitrified state, and exhibit obscure marks of crystallization.

Along the north-west side of the island there runs a belt of low land about six miles long, varying from a quarter of a mile to a mile in breadth, and presenting to the sea a perpendicular front from fifty to three hundred feet in height. The whole of this plain is a confused assemblage of stony fragments, scoria, and other volcanic products, resting on a bed of lava. All these matters are in a progressive state of disintegration, and the greater part of them reduced to mere nuclei imbedded in their constituent elements in the state of a black indurated earth.

The northern extremity of the plain is in a great measure cleared of its wood. By setting fire to the grass the trees have been so far scorched as to destroy their vegetation; but they still lie strewed along the ground, and it will cost some labour to remove them. The rest is still in a state of nature, covered with an impenetrable copse.

The surface of the plain, though apparently smooth and even while clothed with its native herbage, is in fact extremely irregular, being every where broken by small ridges of loose stones concealed under a mere scurf of soil. Between those ridges, however, the soil is pretty deep, and consists for the most part of the remains of decayed vegetables, with here and there a substratum of alluvial earth approaching to the nature of clay. It is soft, spongy, retentive of moisture, and possesses most of the characters of peat. This soil has been found admirably adapted for the

production of culinary vegetables, but is far too light to support the weight of trees or large shrubs.

This plain is the only part of the island that is in the least susceptible of cultivation; and serious obstacles oppose the conversion even of this to the purposes of agriculture. With the exception of the few spots already mentioned, where the earth washed down by the rain has accumulated, the whole of the ground, before it will be fit to receive the plough, must undergo a regular trenching in order to remove the loose stones, and to loosen the hard earth which lies immediately underneath the surface, and incorporate it with the vegetable mould. After this preliminary operation, there can be no doubt that the soil will yield a fair return in all sorts of European grain.

The ascent to the peak is practicable in sundry places; but the undertaking is attended with serious difficulties, and not free from danger. I went up on the 4th of January, accompanied by Dr. Evers, a couple of servants, and a guide, who had been up some days before. We experienced some obstruction at the outset in making our way through the long grass (*Spartina arundinacea*) which grows along the lower part of the mountain in close entangled tufts. As we advanced, our progress was retarded by the extreme steepness of the ascent, and the loose incohesive nature of the rocks, which we could hardly venture to touch, lest these fragments should fall upon our heads; nor did we run less risk in availing ourselves of the branches of the arborescent *Phylica* to support our weight; for the greater proportion of these being rotten, it was necessary for us to choose with caution, as a mistake might prove fatal. After a laborious effort of three hours, however, we gained the table land, and there discovered to our mortification, that the upper region of the mountain was completely obscured. Urged by a strong west wind, the cloud broke

from

from time to time against the sides of the dome, and gave us a transient glimpse of the peak at a height and distance that were by no means encouraging. After resting, however, for a few minutes, we proceeded across the base of the dome, trusting that the cloud would be dissipated by the meridian sun; nor were we in this respect altogether disappointed. In the mean time, we found the ground as we advanced a perfect swamp, studded with tufts of small rushy plants, that gave way under the slightest pressure. Here also we had to pass through extensive patches of fern (*Lomaria robusta*), the stems of which, like junks of old cable, trail along the ground, and cross and recross each other in such an intricate manner, that it required all our circumspection to avoid stumbling over them. Further on, the ground becomes more firm, but is perforated in all directions by the various species of Petrel, which resort in myriads to the island during the season of incubation, and burrow in the earth. The weaker tribes of these birds are devoured in vast numbers by the Skua gulls, which pounce upon them as they come out of their holes in the evening, and leave nothing but the bones and feathers to attest the havock made among them.

The surface of the dome is furrowed on every side with ravines, which take their rise among the scoria of the peak, deepen as they descend, and open in tremendous chasms on the edge of the precipice. The various portions of the surface thus cut off in a great measure from all mutual communication, grow narrower and narrower as you approach the base of the peak, and dwindle at last into bare ridges of scoria, so sharp and so steep, that the wild goats of the mountain dare hardly venture to thread them. That ridge in particular over which we must either have passed or returned without accomplishing our object, is for at least fifty yards not more than twelve inches in diameter. The wind blowing

ing in violent gusts at the time, rendered it the more difficult to maintain that strict equilibrium of body, the slightest bias from which, either to one side or the other, would precipitate any of us in an instant to the depth of several hundred feet. We got safely over it, however, though with some trepidation, and in a manner as various, I believe, as the number of our party would admit of.

A short way beyond this ridge vegetation ceases; not so much, however, owing to the elevation of the ground, as to the total want of any kind of soil wherein plants could fix their roots. From this point to the summit, a distance of about a mile and a half, the whole is a mass of scoria, fragments of cellular lava, and all sorts of volcanic refuse, constantly slipping under your feet, and rendering the toil of ascending excessive. For nearly a mile we walked along a ridge of blue lava, which seems to have been at one time covered over, but afterwards left exposed by the gradual recession of the loose matters which covered it. In grain and colour it resembles the veins which intersect the island mass; but is disposed on the slightest stroke to break into small amorphous fragments.

The crater is nearly a mile in circumference: its border is irregular, the south side being two or three hundred feet higher than the north, by which we ascended. At the bottom of it there is a pool of water about 150 yards in diameter, to which the descent by the north side is gradual and easy. Its depth appears to be inconsiderable, as we could discover the bottom more than half way across; and its border is covered with rounded fragments of cellular lava, which float about at the humour of the breeze. The water is pure, and untainted with any mineral solution. From the peak we could see the distant ocean on all sides over the cloud which still shrowded the lower part of the dome; but no part of the low land can be seen at any time, being covered by the

the projection of the table land. I found several mosses on the summit of the peak and some lichens, among others the *L. paschalis*. There was also a large patch of snow a considerable way down its side, and another within the crater.

Besides the principal crater, which terminates the peak, there are several others scattered over the declivity of the dome, which must have rested for ages quiescent, as they are now covered with verdure. Two of these are situated near the edge of the table land, looking down on the landing-place.

As we walked down the mountain on our return, we passed among flocks of albatrosses engaged in the process of incubation, or tending their young. There are four species of them that breed on the island, none of which hatches more than one egg at a time; the *Diomedea spadicea*, *exulans*, *chlororynchos*, and *fuliginosa*: the two former give themselves no trouble in constructing their nest, merely choosing a dry spot of ground, and giving it a slight concavity to prevent the egg from rolling out of its place. The egg is white, very large, and of a peculiar shape, being uncommonly long in proportion to its diameter, and equally thick, or nearly so, at both ends.

The black albatrosses (*D. fuliginosa*) are at this season gregarious, building their nests close to each other. In the area of half an acre I reckoned upwards of a hundred. They are constructed of mud, raised five or six inches, and slightly depressed at the top. At the time we passed, the young birds were more than half grown, and covered with a whitish down. There was something extremely grotesque in the appearance of these birds standing on their respective hillocks motionless like so many statues, until we approached close to them, when they set up the strangest clattering with their beaks, and, if we touched them, squirted on us a deluge of fœtid oily fluid from the stomach.

The

The *D. chlororynchos* builds its solitary nest in some sheltered corner, selecting in particular the small drains that draw the water off the land into the ravines. There it runs up its nest to the height of ten or twelve inches, of a cylindrical form, with a small ditch round the base. A curious circumstance with regard to this bird is, that when irritated the feathers of its cheeks are separated, so as to display a beautiful stripe of naked orange skin, running from the corners of the mouth towards the back of the head.

All of these birds nourish their young by disgorging the contents of their stomach. They are never observed to carry any article of food in their bill: those matters, indeed, from which they derive the chief part of their sustenance, the blubber of dead whales, seals, and sea-lions, would melt away if carried in the bill to any distance. We could not help admiring the utter unconsciousness of danger displayed by them on our approach: they never showed the least disposition to move out of our way: even when kicked or pulled off their nests, they made not the smallest show of resistance; but quietly returned to their post, or stood still until we passed on. Their plumage is in the finest order, copious, and without the slightest stain. They find great difficulty in getting on wing, and must run twenty or thirty yards along the ground with expanded wings before they can get fairly under way. We had the curiosity to take one of them by the point of the wings and fling it over the rock; yet, though it had several hundred feet of a clear fall, it never recovered itself, but dropped down like a stone. On this account, when not engaged with their young, they usually rest upon the edge of the precipice, from which they can launch at once into the air; and on entering again upon that difficult part of our route, we had to kick upwards of a dozen of them to the right and left of us before we could get on.

We

We arrived at the cantonment about sun-set, after a most fatiguing journey of fourteen hours.

In viewing the general structure of the island, and comparing its diminutive size with the great number of spiracles crowning its summit, and which must all have been at one time or another in a state of activity, there can remain little doubt that the whole of it is of igneous origin. The solid foundation on which it stands is undoubtedly lava. The platform which forms the plain is also a sheet of lava; and though the face of it at one part breaks into prismatic columns, after the manner of basalt, yet the bed of semivitrified rock on which it rests seems to leave no room for doubt with regard to its origin. An entire hill, seven or eight hundred feet high, near the centre of the plain, is composed of nothing but stratified tufa. The plain is encumbered with large detached masses of porphyritic stone, and with others, inclosing crystals of sulphur or of augite, which seem to have been ejected in their present state from the interior of the mountain; and in one instance I met near the base of the mountain, and under one of its strata, with a specimen of the convoluted lava, so common in the Pays-brûlé of the island of Bourbon.

The climate of Tristan da Cunha is so mild, that the herbage remains unimpaired throughout the year. Snow is never seen on the low land; and the only indicaton of winter is a transient sprinkling of hoar frost, too slight to give any serious check to vegetation. The thermometer during summer rarely ascends beyond 74 degrees in the shade, and stands at about 110° when exposed to the meridian sun. At night it occasionally falls as low as 48 or 50 degrees.

If we may give credit to the information of a man of the name of Currie, who has lived on the island for the last six years, its climate may be regarded as one of the most rainy in the world.

According to his account, the months of January, February and March are the only period throughout the year in which fair weather may be expected with any degree of certainty. During the other nine months the rain, he told us, is almost perpetual. How far the latter part of this statement may be correct, remains still to be proved; but it was our misfortune so far to experience the fallacy of the first, that from the 28th of November, the day on which the detachment landed, to the 30th of March, when I quitted the island, it rained on an average every second day.

This excessive humidity is not however entirely chargeable to the latitude in which the island is situated. Of this we had frequent and tantalizing proofs; for, at the very time that the rain poured heaviest down, we could plainly distinguish from under the skirts of the cloud which hung over us, the distant horizon illuminated by the rays of the sun.

The power which high mountains possess of condensing the moisture of the atmosphere, and precipitating it in the form of rain, is no where, indeed, more apparent, or more unremittingly exerted than on this island. The upper region of the mountain is usually involved in a thick cloud, which not only obscures the whole island, but extends its shade to some distance over the surrounding ocean. From this cloud the rain descends in heavy and protracted showers, for the most part on the lower grounds only, but occasionally on the summit also. In the latter case its fall is announced by the sudden appearance of torrents of water pouring in a hundred channels over the edge of the precipice, dashing down from cliff to cliff, and forming a series of cascades the most magnificent, perhaps, on the whole face of the globe.

With such a moist climate, and such frequent rains, it is a circumstance worthy of remark, that the island is but scantily supplied with running water. The only permanent stream of any magnitude

magnitude in the whole island, is one which gushes out at the base of the mountain immediately behind the cantonment. Excepting this brook, you meet with nothing from one end of the plain to the other but the dry beds of mountain torrents, impetuous, indeed, while they flow, but ceasing with the shower to which they owe their existence.

This singular deficiency of springs may, perhaps, be attributed to the nature of the rocky mass of which the island is formed. Though regularly stratified, the rock is cracked and split in all directions, and the rain transmitted through the spongy, absorbent soil, penetrates easily through its fissures, and sinks down at once to the level of the sea, where it may be seen along the shore gushing out through the sand on the reflux of every tide.

Notwithstanding the frequency of the rains, the climate appears to be abundantly healthy. Not a symptom of sickness appeared among the soldiers during the four months I remained on the island.

The spot pitched upon for the cantonment is at the northern extremity of the plain, about half a mile from the landing-place, and within range of cannon-shot from the anchorage. It is plentifully supplied with excellent water from the stream already mentioned, which runs close by it, and which, even during the hottest days of summer, maintains the low temperature of 50 degrees. This stream, after running its course for about half a mile, precipitates itself in a cascade over the face of the rock into a small sandy cove, where boats can easily put in to supply shipping with wood and water.

The prevailing winds off Tristan da Cunha blow from the westward and southward. Strong gales are frequent, but rarely continue above twenty-four hours. They never blow quite home on the island, but incline upwards at some distance from the shore,

and striking against the face of the mountain, are beat back on the low land in furious whirlwinds.

The sea immediately round the island is fathomable to the distance of a mile and upwards. The bottom is every where rocky, and covered with a gigantic species of sea-weed (*Fucus pyrifer*), which, after growing from the depth sometimes of twenty fathoms or more, stretches along the surface of the water, and preserves it in some degree smooth and unruffled during even the highest winds. This is a circumstance of the more importance, as the coast abounds in a variety of excellent fish, which will prove a valuable source of subsistence should the island come to be permanently inhabited. Among these are several species well known at the Cape of Good Hope. The Snook (*Scomber serpens*), the Horse-mackarel (*Scomber Trachurus*), the Roman fish (*Sparus*), and the Jacobeever (*Scorpæna Capensis*). The best fish, however, and fortunately the most abundant, is a species of *Chætodon* I should think, but which is figured by Forster as a New Zealand fish, under the name of *Sparus Carponemus*. To the genus *Sparus* it has certainly no affinity, if the form and disposition of the teeth are of any weight in the character. This fish usually grows to the weight of five or six pounds; and is remarkable for this circumstance, that when pulled up by the hook it discharges from its vent a great quantity of air, which follows it up in large bubbles. A large species of *Perca* is sometimes caught in the deep water. Among the rocks are found an undescribed species of *Callionymus*, and a most beautiful *Labrus*. I saw one *Exocœtus exiliens* that dropped on board a ship while at anchor, and which measured eighteen inches in length. The only shell-fish I observed were a *Chiton*, a diminutive *Cardium*, a *Patella*, and two *Buccinums*. A large crawfish is found in abundance and of a good quality. The *Sepia octopoda*, and an *Echinus*, with a small land insect

sect belonging to the old genus *Cancer*. Several species of *Corallina* are common on the rocks.

Two species of the Seal are the only quadrupeds on the island that can be considered as strictly indigenous, the wild goats and hogs having been introduced subsequently to its discovery by the Europeans.

The Bottle-nosed Seal, or Sea-lion (*Phoca Leonina*). The colour of this animal is blueish-gray along the back, approaching to white on the belly. It sheds its hair once a year, which falls off in large irregular patches, and gives the animal at that season a most ragged and uncouth appearance. The full-grown male measures from twenty to twenty-five feet in length, and yields seventy gallons of oil. The female is considerably smaller. When irritated it has a curious manner of protruding its snout, and inflating the skin over its nose; but there is nothing like the crest with which the head of this animal is ornamented in Shaw's *Zoology*. The whole figure is in truth a complete caricature, without the slightest resemblance to the original.

These animals pass the greater part of their time ashore, never quitting it unless when disturbed, or when, urged by hunger, they repair to the reef to feed on the sea-weed. They may be seen in hundreds lying asleep along the sandy beach or concealed among the long *Spartina* grass which borders the sea-shore. These huge animals are so little apprehensive of danger, that they must be kicked or pelted with stones before they make any effort to move out of one's way. When roused from their slumber they raise the fore part of their body, open wide their mouth, and display a formidable set of tusks, but never attempt to bite. Should this however fail to intimidate their disturbers, they set themselves at length in motion, and make for the water; but still with such deliberation, that on an expedition we once made to the opposite

side

side of the island, two of our party were tempted to get astride upon the back of one of them, and rode him fairly into the water.

The Falkland Island Seal (*Phoca Australis*). This species grows to the length of five or six feet. The fur on the back is dark-brown, intermixed with long hairs tipped with white. The throat and breast are cream-coloured, the belly rufous. The vibrissæ of the male are white, very long, some of them twelve inches, and hang down over its breast. The fore-feet are placed near the centre of the body, which enables it to sit erect, in an attitude much resembling that of a penguin. Though these animals herd occasionally with the sea-lions, they are much more shy in their nature, and speedily forsake those parts of the island where they are liable to intrusion. They bark like a dog, and are of a bold, ferocious disposition.

The wild hogs secrete themselves in the deepest recesses of the wood, where it is impossible to pursue them. Their ordinary sustenance is from the roots of the wild celery and of the *Pelargonium*: but they occasionally prowl along the sea-shore, and feed on the dead carcasses of seals and sea-lions when they fall in their way.

The wild goats have retreated to the highest ridges of the mountain, where they are equally secure from disturbance. From the very small number, however, that has been seen there, it may be inferred that they have not greatly multiplied.

The only land birds on the island are a species of thrush (*Turdus Guianensis?*), a bunting (*Emberiza Brasiliensis?*), and the common moor-hen (*Fulica Chloropus*). These birds have spread over the whole island, and are found on the table-land as well as on the low ground. The *Fulica* conceals itself in the wood, where it is occasionally run down by the dogs; the others fly about the cantonment, and are so tame as to suffer themselves to be caught with a hand-net. The latter proved extremely destructive to our garden,

garden, nipping off the young plants as soon as they appeared above ground: but their ordinary food are the larvæ of certain species of *Phalæna*, and the berries of the *Empetrum* and *Nerteria*.

Of aquatic birds there is great abundance. I have already mentioned four species of *Diomedea*. There are six species of *Procellaria*, among which are the *P. gigantea*, *cinerea*, and *vittata*. The last, and the other three, which are smaller, are night birds, never appearing on wing until after sun-set. They may be caught in any number by kindling a large fire of wood. Attracted by the light, they approach and flutter round it, like so many moths round a candle, till at length the greater number of them, dazzled by the glare, plunge into the flame and perish. The *Larus Cataractes* is the common tyrant of all the smaller birds, and destroys them in multitudes. There are two species of *Sterna*, the *S. stolida*, and one which varies very little from the *S. Hirundo*. The former builds in the trees, and lays a solitary egg. I never saw the nest of the latter.

The Crested Penguin (*Aptenodytes chrysocoma*) conceals itself among the long grass, and in the bottoms of the ravines where they open upon the shore. Here they assemble in countless multitudes, and keep up a moaning noise which can be heard at a great distance; and, combined with the roar of the surge re-echoed from the mountain, and the bold inhospitable coast around you, is calculated to excite a train of ideas by no means pleasant. It is owing perhaps to the scantiness of its plumage that the penguin swims heavier than any other bird, no part of it except the head appearing above the water. This gives it undoubtedly a peculiar facility of diving and pursuing its prey under the water. With the same view, perhaps, its eyes appear to be uncommonly sensible to the stimulus of light. In every bird that I had an opportunity of examining the pupil was contracted to a mere dot.

There are no reptiles of any kind on the island: and the only insects

insects I observed are three small species of *Curculio*; four of *Phalæna*; one of *Hippobosca*; two of *Musca*; one of *Tipula*; one of *Sphæroma*; and one of *Oniscus*. The latter has multiplied astonishingly in the soft vegetable soil, and proved a great nuisance to us, creeping up the roofs of our tents, and dropping thence upon our beds during the night. The common window-fly of the Cape was not observed until two months after our arrival; but before I left the island it had begun to be troublesome.

The Flora of Tristan da Cunha is as copious perhaps as the extent and situation of the island would warrant us to expect; but with the exception of the cryptogamous class of plants, it offers nothing that is possessed of any peculiar interest.

The only plant on the island that approaches to the size of a tree is a species of *Phylica*. This plant occupies not only the whole of the plain, but has also spread over the face of the mountain, wherever its roots could insinuate themselves into the crevices of the rock. In favourable situations it grows to the height of twenty feet and upwards, measuring from twelve to eighteen inches in diameter. Its trunk is extremely crooked and twisted, but the wood is hard, close-grained, and, according to the report of a ship's carpenter, who examined it, would make excellent timbers for vessels of sixty ton and under. Its bark possesses a slight degree of astringency. Owing to the lightness of the soil, and the frequency of high winds, these trees rarely stand upright, but lean against the ground, and cross each other in such a manner, as to make it a business of extreme difficulty to penetrate to any distance through the wood.

Besides the *Phylica* there are only two shrubby plants on the island, both of which belong to the genus *Empetrum*, and may be only varieties of one and the same species. They possess no quality to recommend them, but that they grow on the most barren spots, where no other plant could vegetate.

Of

Of the herbaceous plants, the most remarkable is a gigantic species of *Spartina* (*S. arundinacea*). This grass overruns the whole of the island, from the upper edge of the table-land down to the sea-shore, accommodating itself to all soils and situations. It springs up in large close tufts which, when full grown, are borne down by their own weight, and lean upon each other in such a manner that a person may roll himself over them without any danger of sinking. Its stems grow to the length of six or seven feet, and are of a solid, almost ligneous, texture, and covered with a profusion of leaves. This grass makes an excellent and durable thatch, and the young leaves are eaten by horses and oxen.

The wild Celery grows in abundance over all the low ground, and attains a great size, its stem sometimes measuring upwards of three inches in diameter. It possesses in a high degree the flavour of the garden celery, and by proper management might be brought to equal it in every respect.

A species of *Chenopodium* (*C. tomentosum*), of a strong balsamic odour, is common around the cantonment. An infusion of the dried leaves of this plant is used as a substitute for tea by the Hottentots sent down in charge of the cattle. The soldiers use for the same purpose the leaves of the *Pelargonium*, which hardly yield to the others in strength of odour.

The low ground is overrun with a species of *Acæna* (*A. sarmentosa*), a plant of no apparent utility, but an intolerable nuisance to such as have occasion to walk over the ground where it grows. Its fruit is a sort of bur, which on the slightest touch fixes itself on one's clothes, and falling in a hundred pieces, covers him all over with an unseemly crust of prickly seeds, not to be got rid of without infinite labour.

Description of Four Species of Fish found on the Coast of Tristan da Cunha.

1. CHÆTODON MONODACTYLUS, subolivaceus dorso transversim nigro fasciato, spinis dorsalibus 17; ventralibus 6: intima elongata.

TAB. XXIV.

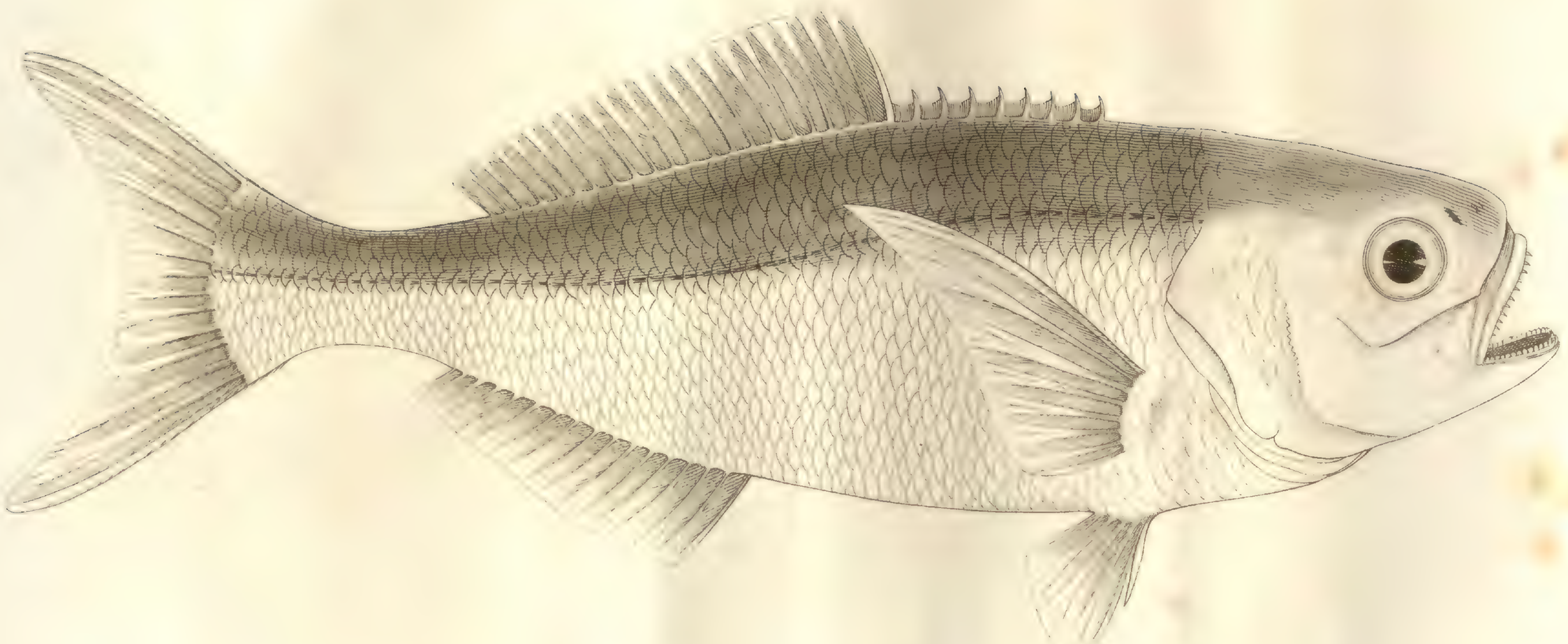
Length eighteen inches. Body oval, compressed. Head sharp; front sloping; mouth small, retractile; lips fleshy; jaws equal; teeth subulate, crowded in the fore part of the jaws, diminishing to a single row behind. Eyes large; iris amber-coloured. G. plates scaly; membrane six-rayed. Dorsal fin 17-24, soft part fleshy and scaly at the base. Pectoral fan-shaped, fifteen-rayed; six lower rays simple, the rest bifid; the sixth ray from the bottom twice the length of the others. Ventral 1-5, triangular considerably behind the line of the pectoral fin. Anal fin fleshy, and scaly at the base, 3-12, the second ray very strong. Tail forked. Scales large, smooth. L. line parallel with the back. Colour varying from olive to bronze, with six broad, obscurely-marked black bars across the back, reaching half-way down the sides. Fins blackish; pectoral amber-coloured, extremely delicate.

This fish is very common on the coast of Tristan da Cunha, and feeds on the leaves of the *Fucus pyriferus*, such of them especially as are covered with serpulæ. It takes the hook freely.

I have called this fish *Chætodon*, as coming nearer to that genus than to any other that I am acquainted with. Among Forster's drawings in the collection of Sir Joseph Banks, a figure of it is given under the name of *Sparus Carponemus*; but the form and disposition of the teeth exclude it from that genus. The specific name was suggested by the uncommon form and length of the fifth

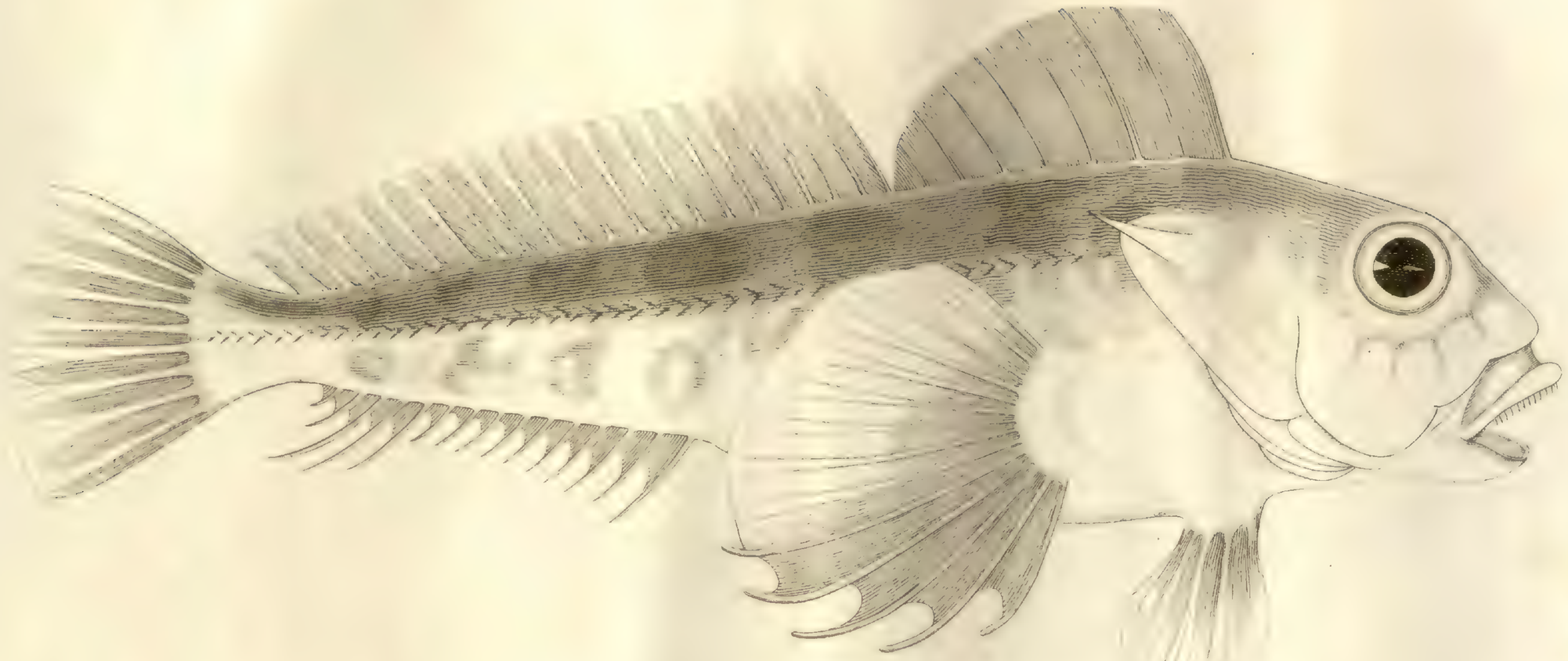
Chætodon monodactylus.

I. Curtis sculp.



Perca antarctica.

I. Curtis sculp.



Callionymus diacanthus.

J. Curtis sculp.

fifth pectoral ray. I have in my possession the figure of another fish from the Cape of Good Hope, nearly akin to this, with the four lowest rays of the pectoral fin lengthened.

2. PERCA ANTARCTICA, nigro-cœrulea subtus argentea, spinis dorsalibus novem: 8 abbreviatis fossula reconditis; ventrali unica.

TAB. XXV.

Length thirty inches; weight fifteen pounds. Head large, abrupt, punctured, naked. Mouth large, ascending. Jaws equal, armed with a single row of small teeth. Palate rough. Eyes large. G. covers scaly, slightly serrated. Membrane seven-rayed. Dorsal fin 9-18, the eight anterior rays very short, lodged in a groove; soft part covered with small scales. Pectoral falciform. Ventral fins 1-6, triangular. Anal 18, scaly at the base. Tail concave. L. line parallel with the back. Scales smooth. Colour dark blue above, silvery underneath.

This fish was caught by one of the officers of the Falmouth, while the ship lay at anchor off Tristan. We never took any afterwards. Flesh not remarkably good.

3. CALLIONYMUS DIACANTHUS, olivaceus maculis virescentibus punctisque albis marmoratus, pinnæ dorsalis prioris radiis (8) corpore aliquoties brevioribus, pectoralis radiis 5 inferioribus spinosis.

TAB. XXVI.

Length seven inches. Body round, tapering from the head. Belly flat. Front depressed. Mouth large, armed with numerous small teeth. Palate rough. Jaws equal. Eyes approximated; iris brown. G. covers marked with tortuous streaks, terminating in two strong, subulate spines, that stand upright when the gills are expanded. G. membrane seven-rayed. First dor-

sal fin eight-rayed. Second twenty-rayed. Pectoral fins rounded, fifteen-rayed; five lowest rays simple, curved; the rest divided. Ventral fins distant, five-rayed. Anal fin sixteen-rayed. Tail convex. L. line raised, parallel with the back. Scales none. Colour olive, marbled with green blotches and white dots. Skin mucous.

This fish is very common among the rocks, and takes the bait greedily. Flesh delicate.

4. LABRUS ORNATUS, olivaceus corpore pinnisque fasciis longitudinalibus azureis.

TAB. XXVII.

Length eight inches. Body oblong, compressed. Head small, naked. Mouth very small, armed with a single row of subulate teeth. Eyes small; iris flame-coloured. Cheeks scaly. G. membrane five-rayed. Dorsal fin the length of the body, twenty-two-rayed, a few of the anterior rays spinous. Pectoral fan-shaped, twelve-rayed. Ventral six-rayed, lanceolate. Anal sixteen-rayed. Tail rounded. Scales large, deciduous. L. line parallel with the back. Colour olive, with four azure stripes along the sides, and three along the dorsal and anal fins. Head variegated with azure stripes; four bars of azure across the tail. Dorsal and pectoral fins, with the upper half of the tail, purple.

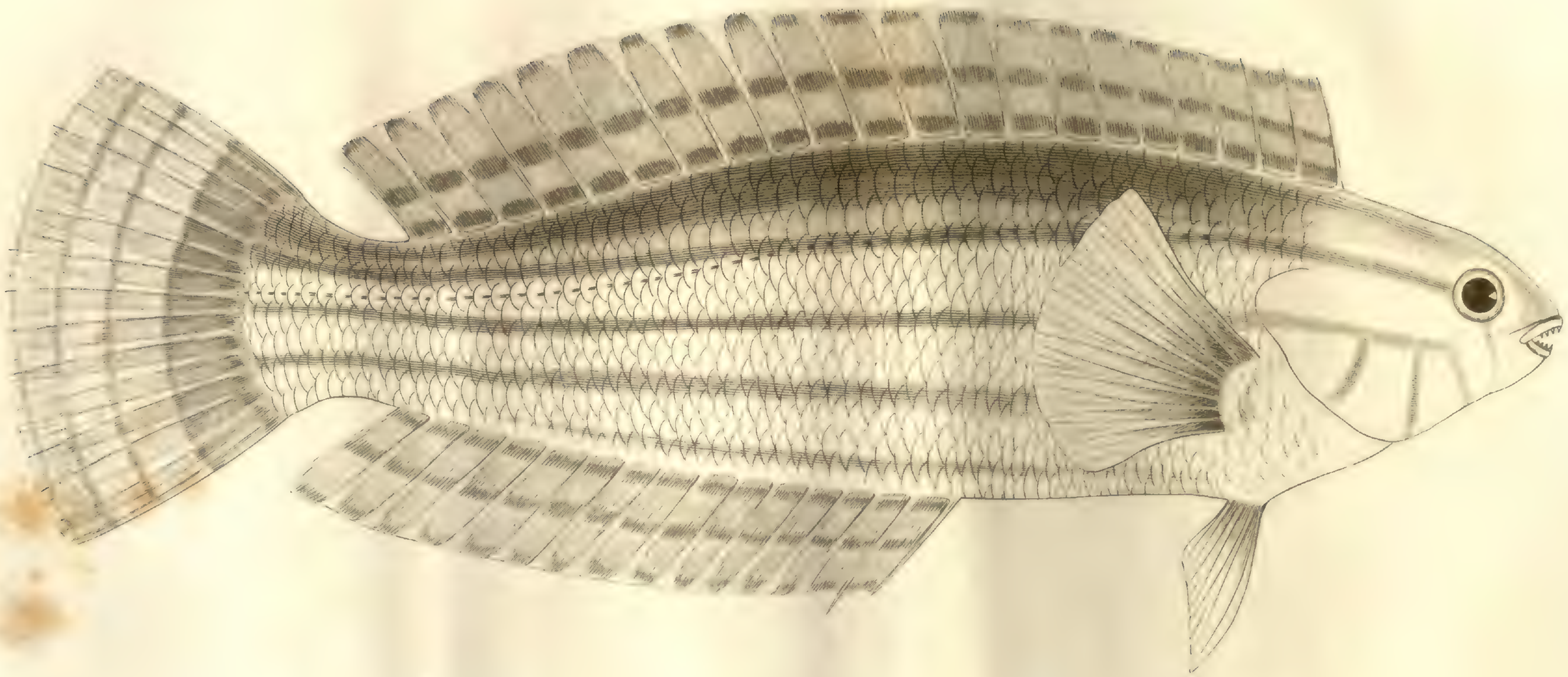
A very rare fish. Caught off the rocks.

Flora of Tristan da Cunha.

1. ACÆNA SARMENTOSA, diandra hermaphrodita, aristis quatuor, capitulis globosis, foliolis argutè serrato-incisis: supra glabris venosis; subtus sericeis, stipulis indivisis.

Ancistrum sarmentosum. *Aubert du Petit Thouars Flore de Tristan d'Acugna*, p. 44. *in Melanges de Botanique.*

This



Labrus ornatus.

T. Curtis sculp.

This plant grows all over the low ground; never, however, taking root as is implied in the specific name. The extremities of the branches are ascending.

2. Isolepis sulcata, capitulo laterali globoso polystachio, spiculis ovatis, squamis latè ovatis nervosis margine scariosis apice calloso.

Scirpus sulcatus. *Aubert op. cit.* p. 36.

Culmus 1—2-pedalis, nudus, compressus, sulco exaratus. Stamina 3. Stigmata 3.

It grows on the plain in large tufts.

3. Isolepis bicolor, culmis angulato-filiformibus, foliis canaliculatis angustissimis, capitulo terminali, spiculis (5—7) ovatis teretibus, squamis margine coloratis, involucro subdiphyllo: foliolo altero erecto capitulum superante; altero deflexo spiculam vix æquante.

This plant grows in moist situations, both on the low ground and the table-land. It collects in tufts, rising from a spongy base resembling a rotten stalk.

4. Isolepis squarrosa, culmis angulato-filiformibus indivisis basi foliatis, foliis canaliculatis angustissimis, capitulo terminali globoso, spiculis (12—20) ovatis, squamis margine concoloribus, involucro diphyllo: breviore deflexo.

5. Isolepis prolifer, culmis angulatis ramosissimis, foliis fasciculatis, capitulis passim proliferis, spiculis oblongis teretiusculis, involucro diphyllo.

Scirpus prolifer. *Aubert op. cit.* p. 36.

Grows on the plain.

6. Spar-

6. SPARTINA ARUNDINACEA, spica communi teretiuscula; partialibus arcte imbricatis, valvula minore glumæ exteriorem oblique truncatam perianthii superante.

Ponceletia arundinacea. *Aubert op. cit.* p. 36.

Culmi plurimi, fasciculati, suberecti, solidi, 5—8-pedales. Folia longitudine culmi, linearia, plana, externe nitida, interne glauca profundè sulcata, margine scabra. Spathæ striatæ, superne ventricosæ. Spica vix emergens, stricta, cylindracea, sexpollicaris, e spiculis pollicaribus undique imbricatis composita.

7. POLYPOGON INTERMEDIUS, panicula coarctata lobata, glumis subulatis pubescentibus, seta perianthii terminali valvula quadridentata breviore.

Phalaris mollis. *Aubert op. cit.* p. 37 ?

Culmi plurimi, 1—2-pedales, fasciculati, adscendentes. Folia linearia glabra, vaginis glabris, suprema ventricosa. Panicula vix omnino exserta, nutans.

This grass grows in spreading tufts, chiefly confined to the clear ground. It is greedily devoured by cattle.

8. AGROSTIS RAMULOSA, culmis filiformibus ramosissimis, foliis setaceis, panicula simplicissima, glumis acutis glabris: carina supra denticulata, perianthio glabro sessili: setula apicis brevissima.

9. AGROSTIS MEDIA, culmis filiformibus ramosis, foliis setaceis, panicula simplici rara, glumis acutissimis pubescentibus: carina longitudinaliter denticulata, perianthio sessili imberbi: seta terminali valvulam subæquante.

Both these species of *Agrostis* are found on the high part of the mountain, forming the chief part of its herbage: a few

few straggling tufts are met with on the low ground, along the bottom of the ravines, where the seeds have been washed down by the torrents.

10. Nerteria depressa. *Willd. Sp. Pl.* i. p. 705.
Erythrodanum alsineforme. *Aubert op. cit.* p. 42. *tab.* 10.

Grows in the plain in the most barren spots.

11. Nerteria assurgens. *Aubert l. c.*
Erythrodanum majus. *Aubert op. cit.* p. 42. *tab.* 11.

Flowers pale yellow, very small. Berry scarlet, the size of a pepper-corn. It grows on the plain.

12. Convolvulus Soldanella. *Linn.?*

This plant is found on the south-east side of the island, growing in the sand close to the shore, and confined to a single spot. It appears to be of recent introduction, having in all likelihood been wafted to this shore by the currents.

13. Phylica arborea, foliis sparsis ovato-lanceolatis aveniis subtus tomentosis, capitulis axillaribus lanatis.
Phylica arborea. *Aubert op. cit.* p. 45.
Truncus arboreus, cortice cinereo. Ramuli albo-tomentosi. Folia conferta, semipollicaria, subtus albo-tomentosa, juniora supra pilosa apice barbata. Bractea longitudine florum. Calyx lanatus. Petala squamuliformia, subrotunda, concava. Capsula corticata, ovata. Flores sæpe abortientes.

14. Chenopodium tomentosum. *Aubert op. cit.* p. 38.

Common on the plain.

15. Hy-

15. HYDROCOTYLE CAPITATA, hispida, foliis reniformibus obsolete lobatis crenatis, capitulis subsessilibus, bracteis pedicellos superantibus.

Hydrocotyle capitata. *Aubert op. cit.* p. 43. *tab.* 12.

Caulis repens subterraneus. Rami debiles, flexuosi, pilosi. Folia utrinque hispida, setis crassis erectis albis. Petioli semiteretes. Stipulæ obtusæ marcescentes. Pedunculi oppositifolii, petiolis breviores. Capitula globosa, multiflora. Bractea lanceolata singulum florem fulciens; exteriores involucrum polyphyllum efformantes.

A common weed on the plain, creeping among the grass. It has a strong taste and odour of the carrot-leaf.

16. APIUM AUSTRALE, umbellis subsessilibus confertis, foliis bipinnatifidis: pinnis suboppositis; laciniis cuneiformibus acutis argute incisis, caule striato.

Apium australe. *Aubert op. cit.* p. 43.

17. RUMEX FRUTESCENS, floribus monoicis, valvulis graniferis, foliis obovato-oblongis.

Rumex frutescens. *Aubert op. cit.* p. 38.

Caules fasciculati, sesquipedales, adscendentes, sulcati. Folia glabra, retusa. Flores glomerati, hermaphrodito-masculi femineis intermixti.

18. RANUNCULUS?

I found this plant growing in a ravine on the table-land; and, there being no flower, judge of its genus merely from the form of the leaves and their extreme acrimony to the taste.

19. CAR-

19. Cardamine propinqua, glaberrima, foliis pinnatis, foliolis obtusis dentatis: terminali majori.

Proxima C. antiscorbuticæ.

Grows in the ravines on the side of the dome.

20. Pelargonium acugnaticum, umbellis subcapitatis multifloris, calycibus pilosis acuminatis, nectario dimidiam pedicelli subæquante, foliis reniformibus obsolete lobatis dentato-crenatis glabris.

Pelargonium acugnaticum. *Aubert op. cit.* p. 44. *tab.* 13.

Herbaceum. Caules plurimi, fasciculati, adscendentes, inferne obsolete trigoni, superne ancipites, pubescentes. Folia reniformi-cordata, venis subtus pubescentibus. Petioli semiteretes. Stipulæ reflexæ. Pedunculus foliis longior. Umbellæ 6—12-floræ. Petala longitudine calycis, cuneata, rubella.

It grows abundantly all over the lower parts of the island, and diffuses the strong odour common to the genus.

21. Sonchus oleraceus. *Linn.*

Common on the plain.

22. Gnaphalium pyramidale. *Aubert op. cit.* p. 40.

Abundant on the cleared ground.

23. Chevreulia stolonifera. *Cassini in Bullet. des Scien.* 1817, p. 69.

Xeranthemum cæspitosum. *Aubert op. cit.* p. 39. *tab.* 8.

Grows on the most barren spots on the plain.

24. Lagenifera magellanica. *Cassini in Bullet. des Scien.* 1816, p. 199.

Calendula pusilla. *Aubert op. cit.* p. 40. *tab.* 9.

Grows on the dome: apparently rare.

25. UNCINIA BREVICULMIS, spica cylindracea longissima basi attenuata, squamis arcte imbricatis apice subcalloso, fructibus lanceolatis acuminatis: dimidia superiore hispida, foliis laxis.

Uncinia brevicaulis. *Aubert op. cit.* p. 35. *tab.* 6.

Uncinia gracilis. *Aubert op. cit.* p. 35. *tab.* 5?

Grows in the thickest part of the wood. The culm greatly elongated after the period of flowering.

26. CAREX THOUARSII, spicis androgynis oblongis confertis sessilibus: infima remotiuscula, squamis aristatis, fructibus rostratis bidentatis, foliis planis.

Carex spicis confertis sessilibus hermaphroditis. *Aubert op. cit.* p. 36.

27. CAREX INSULARIS, spicis masculis pluribus, femineis pedunculatis distantibus: inferioribus pendulis, squamis aristatis, fructibus ovatis bidentatis.

Carex spicis pluribus masculis, femineis pedunculatis. *Aubert op. cit.* p. 36.

Both this and the preceding grow on the plain.

28. EMPETRUM MEDIUM, floribus (plerisque) hermaphroditis, baccis 7—9-spermis, ramulis foliorumque marginibus spuriis (angulis reduplicationis) lanatis.

Empetrum rubrum. *Aubert op. cit.* p. 39. Non Vahlii, cui tamen quam maxime affine.

29. ATRIPLEX PLEBEJA, caule herbaceo erecto, foliis rhombeo-hastatis dentatis obtusis; superioribus hastatis lanceolatisque edentulis.

This plant grows along the shore, and seems to be almost a stranger on the island.

30. LY-

30. Lycopodium diaphanum. *Willd. Sp. Pl.* v. *p.* 23.
Lycopodium clavatum? *Aubert op. cit.* p. 30.

This elegant plant grows indiscriminately on the dome, the face of the table-land, and the plain. It extends to the length of several fathoms, decaying from the base in proportion as it advances, and drawing sustenance by the radicles which it pushes from time to time into the soil. It is entirely clothed with leaves ending in a white filament, which gives it in its fresh state a silky feel. The shoots are numerous and irregularly subdivided. The spikes sessile, cylindrical, two inches long, simple, bifid, or in pairs, equal in thickness to the shoot, and of a yellowish colour. The floral leaves are reflected after the dispersion of the seeds.

31. Lycopodium magellanicum. *Willd. Sp. Pl.* v. p. 15.

Grows on the side of the dome.

32. Lycopodium insulare, capsulis axillaribus, foliis lineari-lanceolatis acutis integris confertissimis patulis reflexisve, caule dichotomo.

Grows on the sides of the ravines.

33. Ophioglossum opacum, spica caulina, fronde cordata opaca: venis inconspicuis, radice bulbosa.

Grows high up on the dome.

34. Acrostichum conforme. *Willd. Sp. Pl.* v. p. 107.
Acrostichum laurifolium. *Aubert op. cit.* p. 31.

In the wood.

35. ACROSTICHUM SUCCISÆFOLIUM, fronde simplice oblonga coriacea utrinque squamosa: squamis peltatis lanceolatis ciliatis.

Acrostichum succisæfolium. *Aubert op. cit.* p. 31.

In the wood.

36. ACROSTICHIUM CILIARE, fronde simplici elongato-lanceolata subacuminata membranacea marginibus costaque squamatis: squamulis subulatis nudis.

Acrostichum ciliare. *Aubert op. cit.* p. 32?

Fronds 6—12 inches long; fertile ones smaller margined.

Grows on the mouldering banks of the ravines.

37. ACROSTICHUM OBTUSATUM, frondibus simplicibus: squamulis subulatis sparsis; sterilibus oblongis; fertilibus ovatis, stipitibus hispidis.

On the highest rocks of the table-land.

38. GRAMMITIS AUSTRALIS. *Br. Prodr.* 146.

On the table-land and rocky borders of the ravines.

39. GRAMMITIS CHEILANTHOIDES. *Willd. Sp. Pl.* v. p. 143.

Asplenium filipendulæfolium. *Aubert op. cit.* p. 34. *tab.* 4.

High on the face of the table-land, and on a detached hill in the middle of the plain.

40. POLYPODIUM AQUILINUM, fronde tripinnatifida deltoidea subtus pubescenti, pinnulis falcatis: inferioribus crenato-incisis, stipite pubescente et paleaceo.

Polypodium aquilinum. *Aubert op. cit.* p. 32.

Caudex repens, basibus stipitum induratis muricatus. Frons 1—4-pedalis, subquadripinnatifida. Stipes rachis costæque

que pubescentes, paleisque rufis deciduis adspersæ, paleæ baseos lineares, confertissimæ. Sori submarginales.

Grows in the wood: very common.

41. Aspidium bifidum, fronde bipinnatifida lanceolata pubescenti, pinnulis integris obtusiusculis: venis indivisis, soris lateralibus seriatis.

Polypodium tomentosum. *Aubert op. cit.* p. 32. *tab.* 3.

Stem about twelve inches long, beset with the remains of the decayed stipes, forked at the top. Fronds from one to three feet long.

In the wood: common.

42. Aspidium coriaceum. *Willd. Sp. Pl.* v. p. 268?

Polypodium calyptratum. *Aubert op. cit.* p. 33.

Grows on the face of the table-land; appears to be very rare; perhaps a stranger. I met with one plant only.

43. Aspidium medium, fronde bipinnatifida deltoidea glabra, pinnulis pinnatifido-incisis dentatis, involucris lateralibus incisis stipite rachique squamosis.

Stem about six inches, crowned with a circle of fronds from nine to twelve inches long.

Grows on the table-land.

44. Cheilanthes viscosa, fronde tripinnatifida pubescenti, pinnulis inciso-dentatis, stipite rachique hispidis.

Polypodium villoso-viscidum. *Aubert op. cit.* p. 33.

Caudex subterraneus, repens, setosus, stipes erectus teres sulco exaratus fragilis rufus. Frons sensim explicata, 2—3-pedalis. Planta tota setis rigidis erectis glandulosis viscidis obsessa.

It grows in the wood: rather common.

45. As-

45. ASPLENIUM MONANTHEMUM. *Willd. Sp. Pl.* v. p. 322.
In the ravines.

46. ASPLENIUM INSULARE, frondibus pinnatis submembranaceis, pinnis oblongis duplicato-crenato-incisis basi superiore auriculatis inferiore excisis.
Asplenium marinum. *Aubert op. cit.* p. 34.
In the wood.

47. ASPLENIUM OBLIQUUM. *Willd. Sp. Pl.* v. p. 315.
Asplenium crassum. *Aubert op. cit.* p. 33.
In the wood.

48. BLECHNUM AUSTRALE. *Willd. Sp. Pl.* v. p. 410. *Aubert op. cit.* p. 33.
In the ravines.

49. LOMARIA ROBUSTA, frondibus pinnatis, pinnis oblongo-linearibus acutiusculis : sterilibus integerrimis : paginis discoloribus ; costa super lanata subter rachique paleaceis, stipitis paleis subulatis elongatis.
Pteris palmæformis. *Aubert op. cit.* p. 30.
This beautiful fern is more generally scattered than most of the others, being found in all moist places from the table-land down to the plain. The trunk grows to the length of four or five feet, sometimes erect, but usually lying on the ground, with its apex only upright. Though not above two inches in diameter, the stumps of the decayed fronds, with their thick scaly covering remaining attached to it, give it an apparent diameter of eight or nine inches. It is crowned with numerous stiff fronds, from one to three feet in length, according to the age and situation of the plant. The barren fronds form a spreading circle, within which, in the summer, five or six fertile fronds shoot up in a perpendicular tuft.

50. Lo-

50. Lomaria antarctica, frondibus pinnatis, pinnis semi-oblongis obtusis integris: terminali breviore, involucris eroso-incisis.

Acrostichum polytrichoides. *Aubert op. cit.* p. 32. *tab.* 2.

On the most barren parts of the plain.

51. Pteris vespertilionis β. *Br. Prodr.* 154.

Grows in the wood: not common.

52. Adiantum æthiopicum. *Willd. Sp. Pl.* v. 452. *Aubert op. cit. p.* 34.

In the ravines.

53. Vittaria stricta, frondibus linearibus acutis strictis, soris intramarginalibus.

Pteris? vittarioides. *Aubert op. cit.* p. 31. *tab.* 1.

Grows in the wood.

54. Trichomanes angustatum, frondibus elongato-lanceolatis glaberrimis bi-tripinnatifidisve, pinnulis linearibus integerrimis, involucris alatis turbinatis: ore dilatato.

On the rocks.

55. Hymenophyllum æruginosum, frondibus lanceolatis bipinnatifidis hirsutis, pinnulis bifidis linearibus, stipitibus filiformibus.

Trichomanes æruginosum. *Aubert op. cit.* p. 34.

On the rocks.

I have nothing to remark regarding the Mosses and Lichens, not having made any memoranda of them.

XXX. *Some Account of the Spiral Tubes or Ligaments in the Genus Terebratula of Lamarck, as observed in several Species of Fossil Shells. By Mr. James Sowerby, F.L.S.*

Read December 6, 1814; *and February* 7, 1815.

I HAVE the honour of submitting to the Linnean Society a sketch, showing the general construction with the extraordinary spiral and perhaps originally cartilaginous tubes of a certain division of the genus *Anomia* of Linnæus, or *Terebratula* of Lamarck. The *Anomia striata* of Martyn is represented at Fig. 2. (TAB. XXVIII.), having its triangular aperture between the beaks, which is characteristic of the division. In this species the side of the spiral tube is of a darker colour than the crystallized carbonate of lime which fills the shell, the whole being limestone. It is probable that these peculiar constructions may give characters to new genera, of which many species are found in England, France, Ireland, and even in New Holland, imbedded in limestone, flint, chert, or sandstone. In a specimen brought from New Holland by Mr. Brown, one only of the spiral tubes is to be seen; and it was not known positively that the shell ought to have two, until, a short time since, I discovered in my collection a complete specimen, from which Fig. 1. is taken.

Fig. 1.

Fig. 1. *Terebratula striata*, *Anomia striata* of Martyn*. The lower valve containing the spiral tubes considerably enlarged, the specimen being little more than one inch long.

a. a. Sections of those parts of the spiral tubes by which they are attached to the upper valve.

b. The place of the triangular aperture immediately above the lower beak.

Fig. 2. *Terebratula striata.* The two valves with one end cut off.

a. The triangular aperture between the beaks.

b. Section of the spiral tube near the end.

I suspect *Anomia cuspidata*†, *Linn. Trans. vol.* iv. *Pl.* 4, with the beak of the perforated valve lengthened and reverse, may have a similar construction within, as well as *Anomia subconica* of Martyn, *tab.* 47.

Since I presented to the Society a sketch of an *Anomia* or *Terebratula* with a spiral internal cartilage, I have received a species of *Terebratula* of a very different construction with a spiral cartilage; and I conceive that a figure of this species would be a convenient addition to my former communication, as showing that the spiral cartilage is less confined to shells of a certain external form than might have been expected. Such as I had seen before had straight elongated hinges, and the deeper shell had a triangular foramen, or distant curved beaks indicating it. The present sketch (fig. 3, 4.) represents a shell curved laterally from the hinge, which must be very short, the beaks very small, and without any space for a triangular foramen externally, although within

* Mr. Martyn sent me this specimen some years since. It shows the triangular aperture, although his figure does not; but the shell showed no sign of the tube till I broke it for information.

† Figured, since the reading of this Paper, as *Spirifer cuspidata* in *Mineral Conchology*, *tab.* 120.

there appears a nearly triangular appendage to the cartilage, which, if not possessed of the outer shell, might indicate a triangular foramen. I presume to lay this sketch before the Linnean Society, hoping that the subject will meet with attention and investigation when opportunity offers. The construction of the shells in my former communication would, without the present specimen, have given an idea of the straight hinge being peculiar to those *Terebratulæ* with a spiral cartilage, as agreeing with Parkinson and Martyn, and might therefore have been misleading. The spiral remains in the present species seem rare, as most of the shells are filled with a hard marley earth. It was found with some other species in Sladacre's Quarry, on the right-hand side of the road leading from Wych to Calwell-Green, a part of the Malvern hills. Some specimens had small round joints of *Encrini* on them.

TAB. XXVIII.

Fig. 3. *Terebratula obtusa.* The remains of the spiral cartilage and the somewhat triangular appendage; the shell having been worn off.

Fig. 4. The marle cast nearly covered with the shell and two small round joints of an *Encrinus*, perhaps the new species mentioned by Mr. Horner* as found also at the Malvern hills.

I add also a drawing of a small *Terebratula*, which might be called *T. sinuata*, with a straight hinge. It seems plentiful in a marley stratum somewhere. I do not think it is noticed in any work; and I shall be glad to learn its locality.

Fig. 5. *T. sinuata*, natural size.

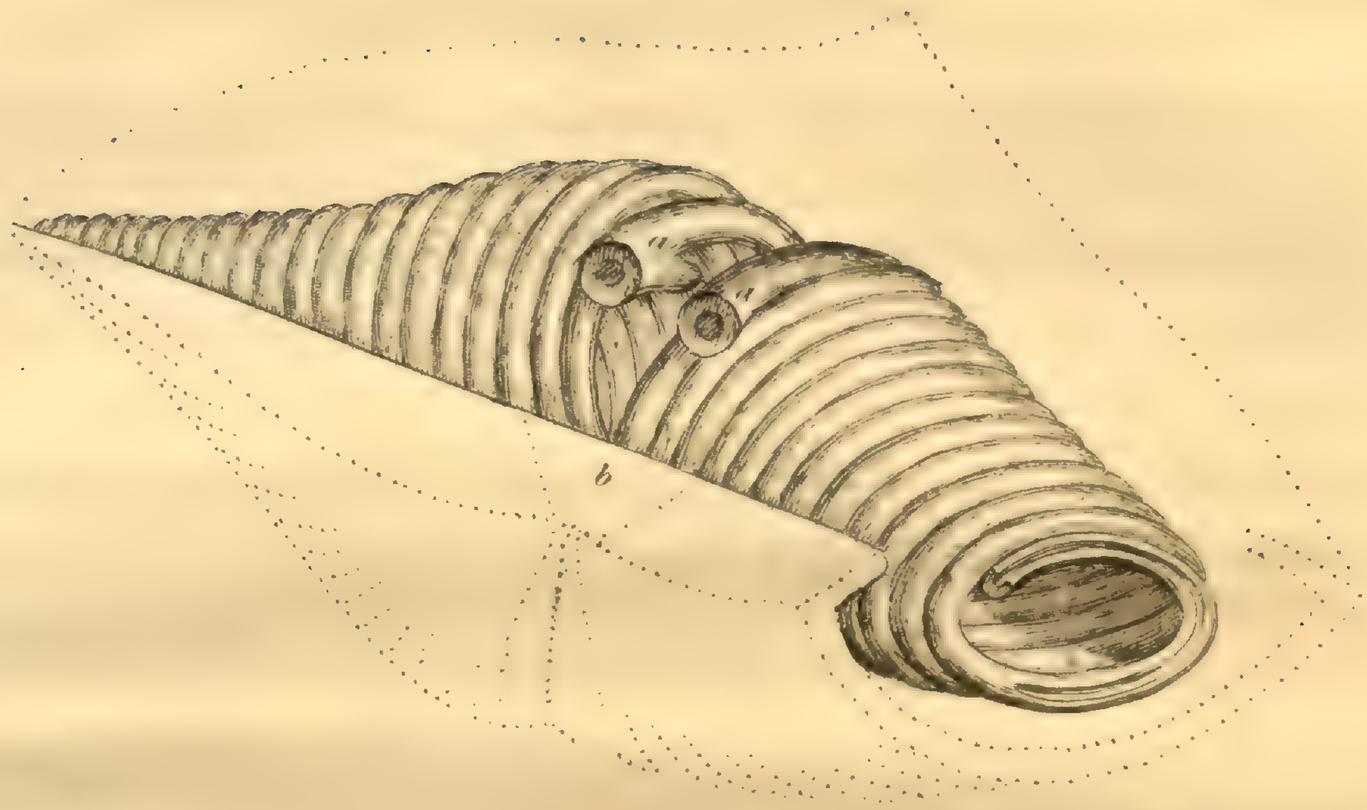
a. Upper side. *b.* Under side.

Fig. 6. *T. sinuata*, magnified upper side.

* Trans. of Geological Society, vol. 2.

XXXI. *On*

1



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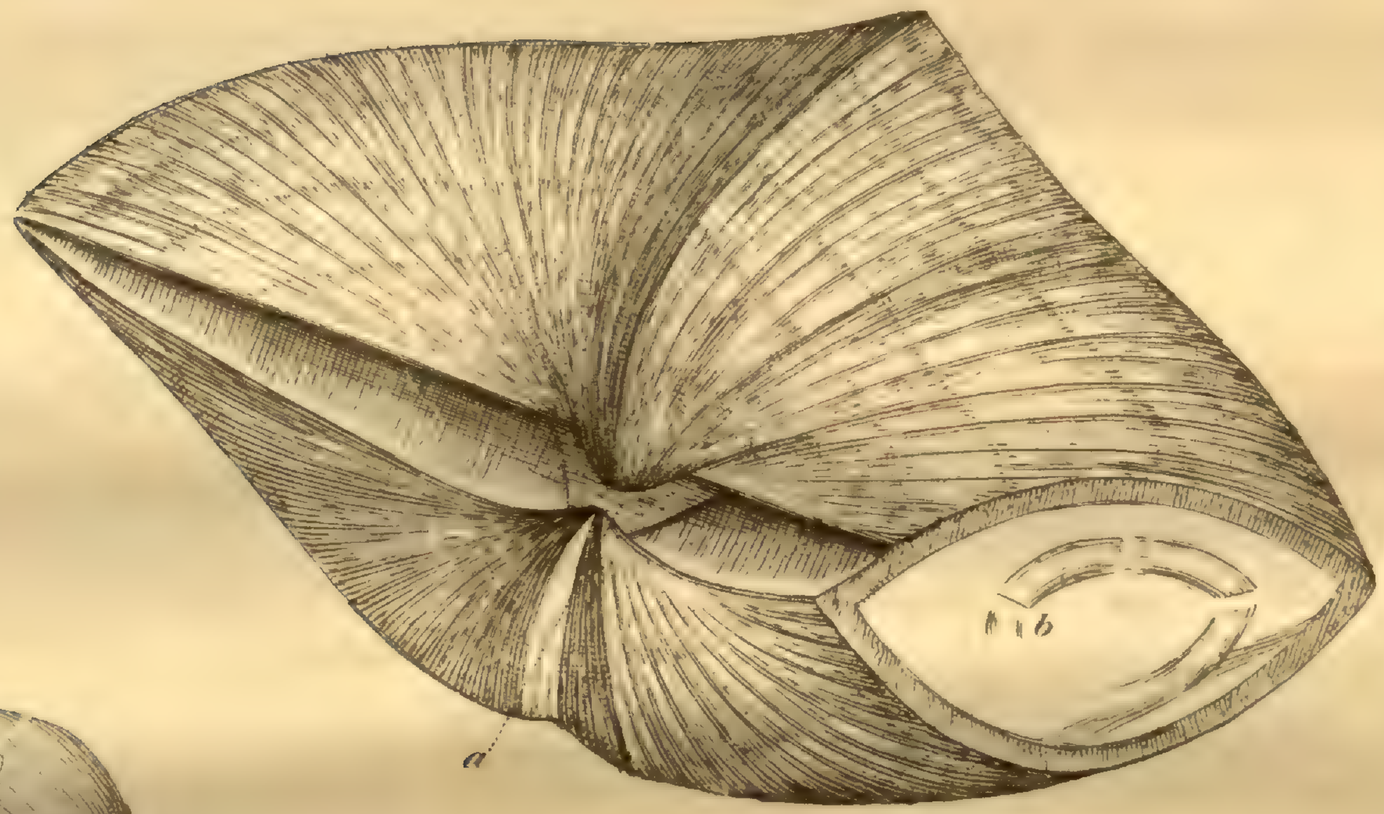

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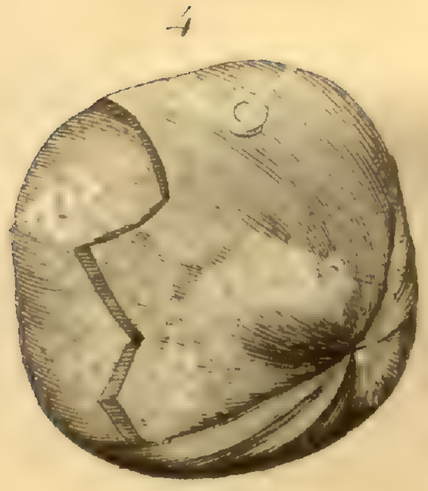

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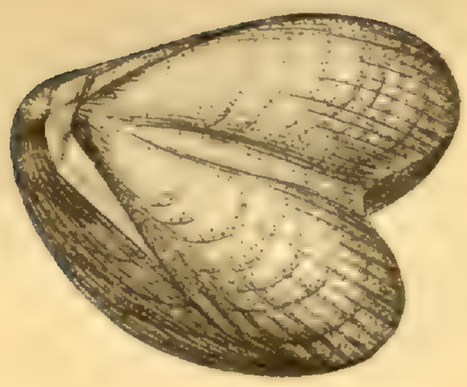


XXXI. *On the Use of the Pedes scansorii of Birds; in a Letter to the Rev. William Kirby, F.R.S. and L.S. By the Rev. Revett Sheppard, F.L.S.*

Read June 16, 1818.

My dear Sir,

Happening a few days since to take up Ray's *Wisdom of God in the Works of the Creation*, I was particularly struck with the passage where, speaking of the Woodpecker tribe, he says, "Their toes stand two forwards, two backwards; which disposition (as Aldrovandus well notes) Nature, or rather the wisdom of the Creator, hath granted to Woodpeckers, because it is very convenient for the climbing of trees."

The attempt to prove this assertion, adopted by so many and able naturalists, to be altogether unfounded, must appear to savour of presumption in one who has so little of the philosopher about him: nevertheless, I hope to convince you that such disposition of the toes in the Woodpecker tribe was intended by the Author of Nature for a very different, though equally wise purpose. I know of but six genera, viz. *Psittacus*, *Cuculus*, *Picus*, *Ramphastos*, *Trogon*, *Bucco*, that are furnished *pedibus scansoriis*, *i. e.* with two toes before and two behind; and of this number I am acquainted with the manners of the three first only.

To begin with *Cuculus*:—I speak only of our common species: Here is a bird furnished with two toes before and two behind, and yet is actually never known to climb at all; a convincing proof that such conformation does not necessarily bring with it the power

of climbing; more especially when we consider that the Nuthatch (*Sitta europæa*) and Tree-creeper (*Certhia familiaris*) have their toes placed in the usual manner, and yet run up and down trees with as much facility as the Woodpeckers. The use of the *pedes scansorii**, then, to the Cuckow (as they evidently, in this case, conduce not to climbing,) I judge to be this: It is well known that this bird will oftentimes sit by the half-hour together on the bough of a tree vociferating its loud and pleasing note; in doing this it sits remarkably forward, and appears in constant agitation, continually moving its body up and down with great elegance: now, as it sits so forward whilst using this exertion, it would be liable to lose its balance and quit its hold, had it only one toe behind; whereas, by the contrivance of two, it is enabled strongly to adhere to the branch.

Psittacus also has the *pedes scansorii*, and is actually a climbing genus; yet does not this conformation in my opinion in any manner conduce thereto. To say that Parrots assist themselves with their beaks in climbing, would not argue the *pedes scansorii* to be of no utility. Their real use to this genus seems to be not only to grasp their food (for the foot of the Parrot serves the purpose of a hand in that respect), but to enable them to step securely from one branch to another, and likewise to hang suspended, as they often do; in which case the two toes before and two behind certainly give stability to their hold.

With respect to the *Pici*, rather a clumsy tribe, the very stiff feathers in the tail are of material service to prop them up in the act of climbing: not so the *pedes scansorii*, for the Nuthatch without them runs up trees equally well. Of what use then can these be to the Woodpecker? I answer, that in boring trees, (in which

* I think a more appropriate term might be adopted for this peculiar conformation; and for this purpose I take the liberty of suggesting the word *comprehensorii*.

occupation

occupation the bird is often engaged for a considerable length of time), its weight is thrown backward, and thus the supply of two toes behind is rendered extremely necessary for its support.

What makes me think the wise Author of Nature had this end principally in view is, that the Nuthatch, from the want of this conformation, is, when breaking nuts, under the necessity of sitting with its head downwards. It may be alleged that its flexible tail compels it to this position; but, as I have before observed, it runs up trees with equal or greater facility than the Woodpecker, notwithstanding that disadvantage.

It would be a curious circumstance, and a conclusive argument in my favour, should it ever be ascertained that the three-toed Woodpecker (*Picus tridactylus**), which has only one toe behind, bores trees in the attitude assumed by the Nuthatch when breaking nuts.

I have now brought this letter, which I fear has tired your patience, to a conclusion; but as it is upon a subject hitherto not sufficiently examined into, you may possibly think it worthy of being communicated to our scientific brethren.

I am, &c.

Wrabness Parsonage,
April 15, 1818.

REVETT SHEPPARD.

* Linnæus, in his description of the *Picus tridactylus*, says, "Europæus vertice flavo, Americanus rubro est." It is worthy of observation, that a fine specimen, brought by my brother Edmund Sheppard, Esq., of the Royal Artillery, (whose assiduity in collecting subjects of natural history when abroad, entitles him to great credit,) from Drummond's Island, in Lake Huron, Upper Canada, has the *crest*, like the European species, of a *bright yellow*.

XXXII. *An Account of a new Species of Gull lately discovered on the West Coast of Greenland. By Joseph Sabine, Esq. F.R.S. and L.S. &c.*

Read December 15, 1818.

I RECEIVED in the last summer, by one of the whaling ships from Davis's Straits, a collection of birds, which had been made by my brother Captain Edward Sabine of the Royal Artillery, who accompanied the late expedition in search of a North-West passage. Among them were specimens of a Gull hitherto unknown and undescribed.

My brother's account of them was as follows: They were met with by him and killed on the 25th of July last on a group of three low rocky islands, each about a mile across, on the west coast of Greenland, twenty miles distant from the main land, in latitude 75° 29′ N., and longitude 60° 9′ W. They were associated in considerable numbers with the *Sterna Hirundo*, breeding on those islands, the nests of both birds being intermingled.

The male and female are nearly the same size, the latter is rather the smallest, but their plumage is exactly similar. The length of different specimens varies from twelve and a half to fourteen inches; the extent of the wings is about thirty-three inches, and the weight from six and a half to seven and a half ounces. The following is a full description. The bill one inch long, the base of both mandibles black as far as the angular projection of the lower mandible, the remainder yellow; the inside of

of the mouth bright vermilion. The irides dark, surrounded by a naked circle of the same colour as the inside of the mouth; a small white speck beneath the eye, scarcely perceptible. The whole of the head and upper part of the neck a very dark ash- or lead-colour; the remainder of the neck behind and before, as well as the breast and belly, pure white; a narrow black collar surrounds the neck at the meeting of the ash-colour and of the white. The back, scapulars and wing-coverts are ash-coloured, very much lighter than the head, but darker than the corresponding parts of the *Larus ridibundus*; the lower ends of the scapulars are tipped with white. The first five primary quill-feathers with black shafts, the whole outer webs of these black, the edge of their upper webs white to within an inch and a half of the tips, the white sometimes continued to the tip; the tips of the first and second of these quill-feathers in some white, in others black; the tips of the third, fourth and fifth white, giving the wing when closed a spotted appearance; the sixth primary quill-feather with a white shaft, having the web more or less black, but principally white, with sometimes a black spot near the end; the other primaries, the secondaries, and the tertials white; the whole under parts of the wings white. The wings extend an inch or more beyond the longest feather of the tail. The legs, feet, and claws black; the thigh feathered to within three-eighths of an inch of the knee; the length of the tarse one inch and a half; the length of the front toes about one inch, the inner one the shortest; the hinder toe small, and placed high. The tail with its upper and under coverts white; the tail-feathers twelve, the outer narrower than the centre ones; the outer tail-feathers about five inches long, the others in succession gradually shortening, so that the whole tail becomes forked by a diminution of nearly an inch.

This

This is the description of the bird in its mature and breeding plumage: it is probable, that in its immature and winter state it resembles other black-headed Gulls, in being divested of the dark colour of its head.

This species lays two eggs on the bare ground, which it hatches the last week in July: the young when first hatched are mottled with brown and dull yellow. The eggs are an inch and a half in length, and of regular shape, not much pointed; the colour is olive, much blotched with brown.

Little of course can be known of the manners and habits of these birds, for they were not seen in any other instance during the voyage through Davis's Straits and Baffin's Bay: the Esquimeaux who accompanied the expedition as interpreter, and who possessed some knowledge of the native birds of South Greenland, had never observed them before. They flew with impetuosity towards persons approaching their nests and young; and when one bird of a pair was killed, its mate, though frequently fired at, continued on wing close to the spot where it lay. They get their food on the sea-beach, standing near the water's edge and picking up the marine insects which are cast on shore.

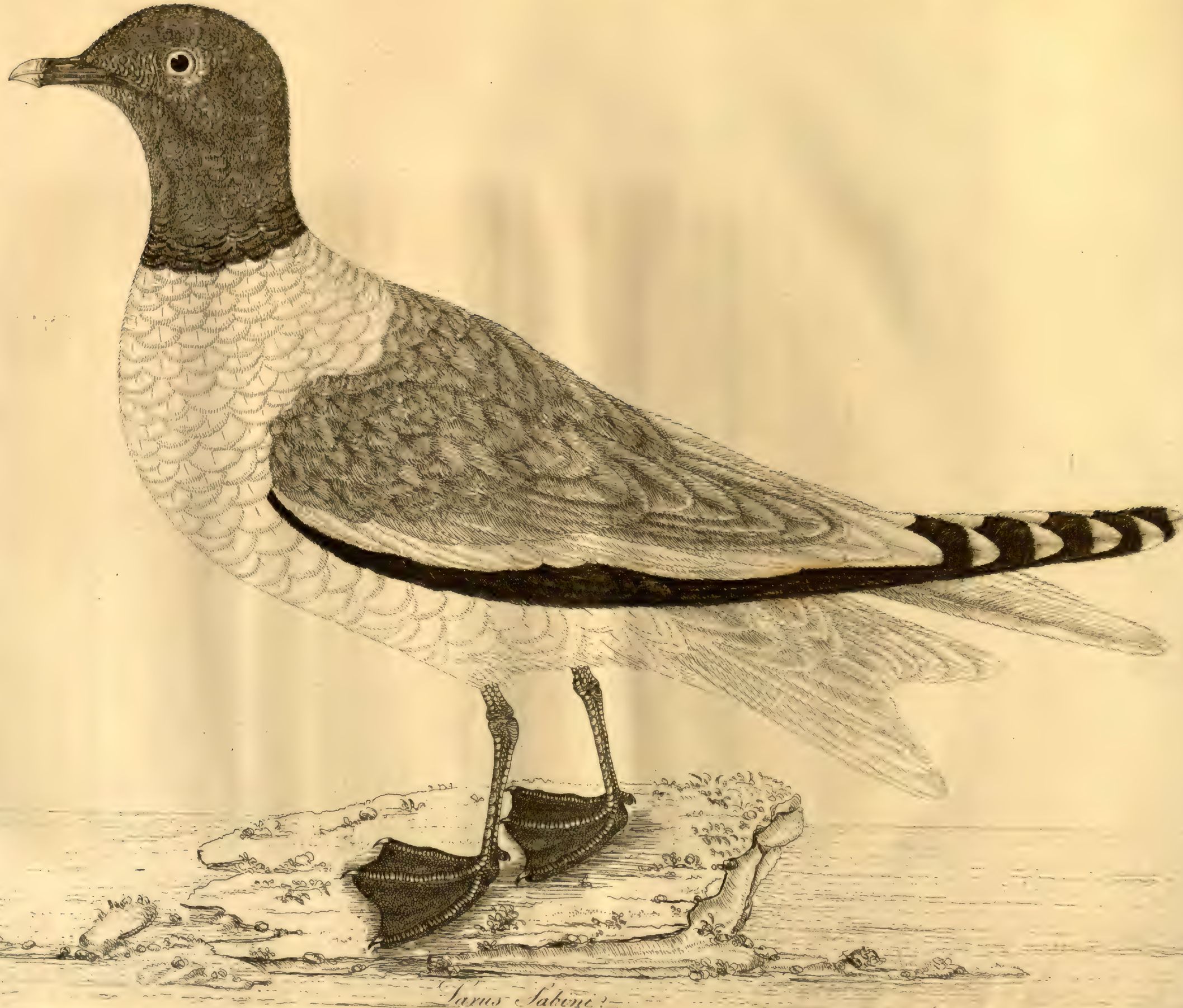
In conformity with the custom of affixing the name of the original discoverer to a new species, this bird has been called *Larus Sabini*. It will naturally fall into the division of the Gulls with black heads, of which there are several species, though most of them are but little known, and it may be distinguished by the following specific character:

L. albidus, capite nigricante, torque cervicali nigro, rostro basi nigro apice luteo, pedibus nigris, cauda forficata.

TAB. XXIX.

The forked tail of the bird will furnish ground, to those who are desirous of increasing the number of genera, to place this in a new

genus



Larus Sabini?

genus intermediate between *Larus* and *Sterna*. If every diversity of character is to become the foundation of a new genus, we shall have as many genera as there are species; and when multiplied to excess, genera will cease to afford the facility of investigation to the examiner of species which they were designed to give. Between each individual species there will always be some difference of character beyond that of colour of plumage, which may be made to constitute what with some modern ornithologists is so improperly called a generic distinction. In the present instance the forkedness of the tail is very remarkable; but if the want of an even termination of the tail-feathers is to constitute a generic distinction, then the *Larus tridactylus* must be removed from its present place and become a new genus; for the tail of that bird, though slightly forked, is certainly uneven, and more distinctly so in the younger birds.

Since I received the specimens which I have described above, I have obtained one from Hudson's Bay of another black-headed Gull bearing a strong resemblance to the *Larus Sabini*, except that it has an even tail, and is without the dark collar round its neck. It is certainly an undescribed species, and must be placed in the genus *Larus*, although its bill approaches more to that of a Tern than that of any other Gull with which I am acquainted. Such instances, I think, satisfactorily prove that, if every existing species were before us in one view, we should find individuals so approaching each other in particular points, as to make it very difficult to determine where to place the boundaries of genera.

XXXIII. *Remarks on the Changes of the Plumage of Birds. By the Rev. William Whitear, of Starston in Norfolk. Communicated by Joseph Sabine, Esq., F.R.S. and L.S., &c.*

Read April 6, 1819.

It is well known that birds annually change their feathers, and that in many of them the new feathers are of a different colour from those which were cast. It is also known, that several birds put on a different livery during the breeding season to that which they wear in autumn. But no writer, with whom I am acquainted, has hitherto pointed out the fact, that in some birds *the full-grown feathers themselves change colour without being replaced by new ones.* Some recent observations that I have made upon birds assuming their summer plumage give me reason to suppose that such a change does really take place.

In the year 1817, Mr. Youell of Yarmouth had sixteen young wild Mallards confined in a small pond by netting; and he was much surprised to find that towards the end of the year these birds put on a great deal of the beautiful plumage of the old bird, and yet that no feathers were to be found floating on the water, or scattered on the banks of the pond, as is usually the case when birds are moulting. Mr. Youell having made the same remark last year upon other birds of the duck genus, and communicated his suspicions to me, that birds sometimes change the colour of their dress without shooting their feathers, I determined to

to make such observations upon them as might tend either to establish or disprove the fact.

On the 9th of January last I received a young wild Mallard, which had nearly assumed the plumage of the adult bird. Upon examining the feathers of this bird, I found many of them which were party-coloured, the same individual feather retaining in some parts the colours of the bird during its first months, and in other parts exhibiting those of the perfect bird. A male Chaffinch, killed in February, had the feathers on the crown of the head blueish ash-colour, except at their extremities, which were rufous-brown, apparently still retaining on those parts the colour of the young bird, while the greater part of each feather had assumed that of the old one. Three specimens of the Swiss Sandpiper, in a state of change from the winter to the summer garb, had many feathers upon the breast and belly perfectly black, others perfectly white, and the rest sprinkled with black and white in various degrees; in some the black just beginning to appear, in others only a little white remaining upon them. A white-fronted goose, killed in October, had the breast, belly and sides, white blotched irregularly with black. The feathers upon those parts exhibited exactly the same varied appearance as those of the Swiss Sandpipers. A Dunlin, in a state of change from winter to summer plumage, presented a similar mixture of black and white in the feathers on the belly; but in this bird the black did not predominate so much as in the foregoing. In a young specimen of the black-headed Gull, killed the 9th of March, the scapulars were of a mixed colour, the same feather retaining some of the brown of the imperfect bird, together with the light blue ash-colour of the adult state. And the two colours prevailed in various degrees, some feathers exhibiting only the nascent shades of the ash-colour, and in others the remains alone of the

brown were discoverable. The wing-coverts were in a similar state of change. Many of the feathers on the head of a Reed-Bunting (killed the same day as the gull) were black with reddish-brown tips, the extremity of each feather apparently retaining the winter tint, while the greater part of it had assumed that of the summer.

The above observations seem pretty strongly to confirm the fact which Mr. Youell has pointed out, namely, that a change in the colour of the plumage of birds does not always arise from a change of feathers, but sometimes proceeds from the feathers themselves assuming at one season of the year a different colour from that which they have at another. This fact may be fully tried upon living birds. If the feathers of a live bird, apparently beginning to change, were marked by fastening a piece of silk to them, notching them, or otherwise, and it was observed that the first colour of the feather gradually disappeared, while the new colour extended itself more and more, till the feather had assumed that exhibited by the perfect bird, the fact would be established beyond contradiction.

Having called the attention of ornithologists to this subject, I hope it will be pursued by those who have better opportunities of investigating it than myself. An inquiry into the changes which the feathered race undergo, can hardly fail of throwing light upon the history of this beautiful and interesting part of the creation.

March 18, 1819.

XXXIV. *A Memoir on the Birds of Greenland; with Descriptions and Notes on the Species observed in the late Voyage of Discovery in Davis's Straits and Baffin's Bay. By Captain Edward Sabine of the Royal Artillery, F.R.S. and L.S.*

Read April 6, 1819.

I HAVE much pleasure in presenting to the Linnean Society a Memoir on the Birds of Greenland. In accompanying the expedition which sailed last year in search of a North-West passage, I had opportunities, when not engaged in the official duties which I was sent to perform, of making some observations on the Ornithology of that part of the world.

Of fifty species enumerated by various authors as having been found in Greenland, twenty-four fell under my notice: some interesting facts relating to these have been ascertained, and four other species have been added to the list, one of which has not been before described by any naturalist. That so few birds were seen is to be explained by the circumstance, that the ships very rarely approached the shores so as to permit a landing; but it is confidently hoped, that the voyage which is about to be undertaken will afford facilities for more extensive research.

I have confined my account to the birds seen either in Davis's Straits or in Baffin's Bay, omitting all notice of those observed on the voyage when we were nearer the shores of the British islands than those of any part of Greenland.

The works which have been generally quoted are the following:

Gmelin,

Gmelin, *Systema Naturæ Linnæi.*
Latham's *General Synopsis of Birds.*
Latham's *Index Ornithologicus.*
Fabricii *Fauna Groenlandica.*
Brünnichii *Ornithologia Borealis.*
Pennant's *Arctic Zoology.*
Linnæi *Fauna Suecica*, Editio altera.
Müller, *Zoologiæ Danicæ Prodromus.*
Temminck, *Manuel d'Ornithologie.*
Wilson's *American Ornithology.*
Pennant's *British Zoology.* Second edition.
Montagu's *Ornithological Dictionary and Supplement.*

I did not consider it expedient to introduce the synonyms of or reference to any other authors than those above mentioned, except the particular circumstance of any individual case required it; where such occurs, the title of the work will appear in the reference itself.

1. FALCO ISLANDICUS. *Jerfalcon.*

F. Islandicus. *Gmel.* i. 275. *Lath. Ind. Orn.* i. 32. *Temm.* 33.—White Iceland Falcon. *Lath. Syn.* i. 71.—F. Candicans. *Gmel.* i. 275.—White Jerfalcon. *Lath. Syn.* i. 83. & *Supp.* 21.—Gyrfalcon. *Arct. Zool.* ii. 221. *Br. Zool.* i. 217.—Jerfalcon. *Mont. Dict.* & *Supp.*—F. Islandus. *Gmel.* i. 271. *Fabr.* 58. *Brün. no.* 7 & 8. *Müll. no.* 73.—Spotted Iceland Falcon. *Lath. Syn.* i. 71.—F. Rusticolus. *Gmel.* i. 268. *Fabr.* 55. *Faun. Suec.* 19. *Lath. Ind. Orn.* i. 28.—Collared Falcon. *Arct. Zool.* ii. 222. *Lath. Syn.* i. 56.

YOUNG BIRDS. F. Gyrfalco. *Gmel.* i. 275. *Lath. Ind. Orn.* i. 32. *Faun. Suec.* 22.—F. Fuscus. *Fabr.* 56. *Brün. no.* 9.—F. Sacer. *Gmel.* i. 273. *Lath. Ind. Orn.* i. 34.—Sacre Falcon. *Lath. Syn.* i. 77 & 78. & *Supp.* 20. *Arct. Zool.* ii. 202.—Dusky Falcon. *Arct. Zool.* ii. 220.—American Falcon. *Lath. Syn. Supp.* 38.—Brown Jerfalcon. *Lath. Syn.* i. 82.—Iceland Falcon. *Lath. Syn.* i. 70. *Arct. Zool.* ii. 216.—Greenland Falcon. *Lath. Syn. Supp.* 36.

The Jerfalcon was seen in a single instance at Baffin's Three Islands, on the west coast of Greenland, in lat. 74°. It was wounded, but got away.

The

The progress of this bird from youth, when it is quite brown, to the almost perfect whiteness of its maturity, forms a succession of changes in which each individual feather gradually loses a portion of its brown as the white edging on the margin increases in breadth from year to year; such has been the cause of the variety of synonyms which have been referred to.

2. FALCO PEREGRINUS. *Peregrine Falcon.*

F. Peregrinus. *Gmel.* i. 272. *Lath. Ind. Orn* i. 33. *Temm.* 34.—Peregrine Falcon. *Br. Zool.* i. 218. *Arct. Zool.* ii. 202. *Lath. Syn.* i. 73. & *Supp.* 18. *Mont. Dict.* & *Supp.* —F. Communis. *Gmel.* i. 270. *Lath. Ind. Orn.* i. 30.—Common Falcon. *Lath. Syn.* i. 65.—Lanner. *Br. Zool.* i. 223.—Great-footed Hawk. *Wil. Am. Orn.* ix. 120.

Killed in the third week of September in lat. 66° N. and long. 58° W., and therefore most probably from America. Fabricius does not mention this bird as an inhabitant of Greenland. The specimen from which the note is taken was a young bird, and remained for some hours about the ship in company with three others. I have not hesitated to add the synonym of the *F. communis* to the other received ones of this species; the French specimens under that name fully proving the identity. The broad black line or patch, extending from the eye down to the throat, is a distinguishing mark of this bird, and of the *Falco Subbuteo*, or Hobby, in the various states of their plumage; the difference in size of the two species will always prevent their being confounded.

I suspect that the *Falco Lannarius* of Brünnich is a Merlin, and therefore have not referred to it. The Lanner of the *British Zoology* is a young Peregrine Falcon; but the *F. Lannarius* of Linneus and Gmelin, of Latham and others, as well as the Lanner of the *Arctic Zoology* and of Latham's *Synopsis*, is a distinct species (as I am informed by M. Temminck) common in Russia, Poland, and Hungary, to which also the *F. Stellaris* and Starry Falcon of authors must be referred, being the same bird in a younger state.

state. These have hitherto been usually referred to as synonyms of the *F. Peregrinus.*

3. CORVUS CORAX. *Raven.*

C. Corax. *Gmel.* i. 364. *Lath. Ind. Orn.* i. 150. *Temm.* 66. *Fabr.* 62. *Faun. Suec.* 29. *Müll. no.* 86. *Brün. no.* 8.—Raven. *Lath. Syn.* i. 367. & *Supp.* 74. *Arct. Zool.* ii. 245. *Br. Zool.* i. 279. *Mont. Dict. & Supp. Wil. Am. Orn.* ix. 113.

Killed at Hare Island, and seen on the west coast of Greenland in lat. $75\frac{1}{2}^{0}$. We did not notice a pied one, although such a variety is said to be common in arctic countries.

4. TETRAO LAGOPUS. *Ptarmigan.*

T. Lagopus. *Gmel.* i. 749. *Lath. Ind. Orn.* ii. 639. *Faun. Suec.* 73. *Brün. nos.* 198 & 199. *Fabr.* 114. *Müll. no.* 223. *Temm.* 293.—Ptarmigan. *Lath. Syn.* iv. 741. *Br. Zool.* i. 359. *Arct. Zool.* ii. 315. *Mont. Dict. & Supp.*—T. Rupestris. *Gmel.* i. 751. *Lath. Ind. Orn.* ii. 640.—Rock Grous. *Lath. Syn. Supp.* 217. *Arct. Zool.* ii. 312.

Killed June 19th at Hare Island. The females were laying: they had been abundant, but only a few were left on our arrival, several whalers having anchored there before us, the crews of which had destroyed them. Were I not quite satisfied of the identity of the species, the difference of the plumage of these birds would seem to justify a persuasion that they are distinct; but in all essential characteristics they are the *T. Lagopus.* The peculiarities which are to be noticed have escaped the attention even of Fabricius; who nevertheless describes these birds as seen during the summer. The period when they fell under my observation being that of their full breeding season, it must unquestionably be allowed that they were in perfect summer plumage. The male birds were wholly white, with the exception of the black line from the bill to the eye, of the under tail-feathers, and a very few scattered black feathers on the top of the head: even the shafts of the large quill-feathers were white; the females had not the usual portion of white on the breast; the coverings of the

legs

legs were white, as were the quill-feathers, but the shafts of these were dark; the whole of the coloured plumage was more rich and gaudy than in Scottish specimens. In the latter the ash-colour predominates, in the Greenland Ptarmigan the orange. The bars of brown are also broader and deeper in the Greenland specimens.

5. EMBERIZA NIVALIS. *Snow Bunting.*

E. Nivalis. *Gmel.* i. 866. *Lath. Ind. Orn.* i. 397. *Temm.* 188. *Faun. Suec.* 82. *Brün. nos.* 245 & 246. *Müll. no.* 250. *Fabr.* 117.—Snow Bunting. *Lath. Syn.* iii. 161. & *Supp.* 157. *Br. Zool.* i. 444. *Arct. Zool.* ii. 355. *Mont. Dict. Supp. & Appen. Wil. Am. Orn.* iii. 36.—E. Glacialis. *Lath. Ind. Orn.* i. 398.—Tawny Bunting. *Lath. Syn.* iii. 164. *Br. Zool.* i. 442. *Mont. Dict. & Supp.*—E. Montana. *Gmel.* i. 867. *Lath. Ind. Orn.* i. 398.—Mountain Bunting. *Lath. Syn.* iii. 165. *Br. Zool.* i. 445. *Mont. Dict. & Supp.*

These birds were abundant in Hare Island on the west coast of Greenland, lat. 70° 26′, in the month of June, and were breeding there. We also saw them on the western coast of Davis's Straits, about the same latitude, in September. Fabricius has well described their nest as formed externally of grass, next of feathers, and lined with the hair of foxes. Eggs four or five, dirty white, spotted with ash-colour and yellowish brown; the nests are placed in ledges of the rocks. The song of the male bird was noticed frequently. Notwithstanding the deference which is due to the general accuracy of Montagu, I have ventured to place the Snow, Tawny and Mountain Buntings together, believing them to be the same species in different states of plumage, the effects of age, sex, or climate. Those seen at Hare Island exactly correspond to the Snow Bunting of Montagu, and those on the opposite coast to the Tawny Bunting.

6. SYLVIA OENANTHE. *Wheatear.*

Motacilla Oenanthe. *Gmel.* i. 966. *Faun. Suec.* 93. *Fabr.* 122. *Brün. nos.* 245 & 246. *Müll. no.* 274.—S. Oenanthe. *Lath. Ind. Orn.* ii. 529. *Temm.* 135.—Wheatear. *Lath. Syn.* iv. 465. & *Supp.* 182. *Br. Zool.* i. 521. *Arct. Zool.* ii. 420. *Mont. Dict. & Supp.*

This species was not seen on the shores of Greenland on which we landed: but on our return homewards in October, off Cape Farewell, a few were seen at a distance from the land, doubtless on their passage southward. In our outward voyage, in May, we also met with them in lat. 60° N. and long. 13° W., then most probably migrating northward.

7. TRINGA MARITIMA. *Purple Sandpiper.*

T. Maritima. *Gmel.* i. 678. *Lath. Ind. Orn.* ii. 731. *Brün. no.* 182. *Müll. no.* 206.—Selninger Sandpiper. *Arct. Zool.* ii. 480. *Lath. Syn.* v. 173. & *2d Supp.* 312. *Br. Zool.* ii. 80.—T. Striata. *Gmel.* i. 672. *Lath. Ind. Orn.* ii. 733. *Fabr.* 107.—Striated Sandpiper. *Arct. Zool.* ii. 472. *Lath. Syn.* v. 176.—Sea Sandpiper. *Markwick in Linn. Trans.* iv. 22.—T. Nigricans. *Montagu in Linn. Trans.* iv. 40.—Purple Sandpiper. *Mont. Dict. & Supp.*

Fabricius was the first naturalist who knew this bird to be the same in all its changes of plumage; he called it *T. Striata*; but it being now more generally known as *T. Maritima*, I have given it that name, being what it is usually called when in its summer dress: the specimens killed at Hare Island in June, and at Possession Bay on the 1st of September, were in this plumage. In its winter state it has been called the *T. Striata*, or Striated Sandpiper. As a British bird it has been described only in the latter plumage, and it is the Sea Sandpiper of Mr. Markwick, the Purple Sandpiper and *Tringa Nigricans* of Montagu. Temminck does not notice it in his *Manuel*. The Greenland specimens have been compared with two in my brother's cabinet of British birds, the latter having been killed in winter: the difference of the plumage of the two seasons consists in the under parts during summer having less of dusky and more of white; and the feathers of the back and scapulars being of a much deeper and richer colour, and beautifully marked with broad white edgings: a similar marking is observable, but not so distinctly, on the back of the head

and

and neck; there is also a little dash of ferruginous occasionally interspersed on the upper plumage. This species was found in flocks of six and eight on a shingly beach.

8. TRINGA CINEREA. *Knot* or *Red Sandpiper.*

T. Cinerea. *Temm.* 404.

SUMMER. T. Islandica. *Gmel.* i. 682. *Lath. Ind. Orn.* ii. 737.—T. Ferruginea. *Brün. no.* 180. *Müll. no.* 203.—Red Sandpiper. *Arct. Zool.* ii. 476. *Mont. Dict. & App. Lath. Syn.* v. 186. *Br. Zool.* ii. 89.

WINTER. T. Cinerea. *Gmel.* i. 673. *Lath. Ind. Orn.* ii. 733. *Brün. no.* 179. *Mull. no.* 202.—Ash-coloured Sandpiper. *Lath. Syn.* v. 177. *Br. Zool.* ii. 78. *Arct. Zool.* ii. 474. *Mont. Dict. & Supp. Wil. Am. Orn.* vii. 36.—T. Grisea. *Gmel.* i. 681. *Lath. Ind. Orn.* ii. 733.—Grizzled Sandpiper. *Lath. Syn.* v. 175.—T. Canutus. *Gmel.* i. 679. *Lath. Ind. Orn.* ii. 738. *Faun. Suec.* 65.—Knot. *Lath. Syn.* v. 187. *Br. Zool.* ii. 76. *Arct. Zool.* ii. 473. *Mont. Dict. & Supp.*

BIRDS OF ONE YEAR. T. Calidris. *Gmel.* i. 681. *Lath. Ind. Orn.* ii. 732.—Dusky Sandpiper. *Lath. Syn.* v. 174. *Mont. App.*—T. Nævia. *Gmel.* i. 681. *Lath. Ind. Orn.* ii. 732.—Freckled Sandpiper. *Arct. Zool.* ii. 480. *Lath. Syn.* v. 174.—T. Australis. *Gmel.* i. 679. *Lath. Ind. Orn.* ii. 737.—Southern Sandpiper. *Lath. Syn.* v. 187. *& Supp.* 249.—Aberdeen Sandpiper. *Br. Zool.* ii. 89.

Killed at Hare Island in June. It is probably a rare species in Greenland, being unknown to Fabricius. Its various stages of plumage have been correctly described by Montagu in his *Appendix*, article "Dusky Sandpiper," and by Temminck in his *Manuel:* they had been previously involved in much obscurity, and had given rise to the variety of synonyms which are referred to. In its winter state it is the *T. Canutus*, or Knot: in its progress to the summer state it becomes first the *T. Grisea*, or Grizzled, then the *T. Cinerea* or Ash-coloured Sandpiper: the old birds in summer are the *T. Islandica* and *T. Ferruginea*, and Red Sandpiper: the birds of the first year, not attaining the high colour of the old ones, have been described variously; as the *T. Calidris* or Dusky, *T. Nævia* or Freckled, *T. Australis* or Southern, and the Aberdeen Sandpiper.

9. TRINGA ALPINA. *Dunlin.*

T. Variabilis. *Temm.* 395.

SUMMER. T. Alpina. *Gmel.* i. 676. *Lath. Ind. Orn.* ii. 736. *Brün. no.* 173. *Mull. no.* 197. *Faun. Suec.* 64. *Fabr.* 111.—Dunlin. *Lath. Syn.* v. 185. & *Supp.* 249. *Arct. Zool.* ii. 476. *Mont. Dict. Supp. & App. Br. Zool.* ii. 92.—Red-backed Sandpiper. *Wil. Am. Orn.* vii. 25.

WINTER. T. Cinclus. *Gmel.* i. 680. *Lath. Ind. Orn.* ii. 735.—Purre. *Arct. Zool.* ii. 475. *Lath. Syn.* v. 182. *Br. Zool.* 294. *Wil. Am. Orn.* vii. 39. *Mont. Dict.*

Only a single specimen was killed. The bird is said by Fabricius to be very rare in Greenland. The fact of the *Tringa Cinclus* and *Alpina* being the same bird may be considered as established, the former in the winter and the latter in the summer plumage: for this discovery Europeans are indebted to our countryman Montagu. Even the acute and accurate Temminck has not arrived at clearness on this point in his *Manuel*, though he concludes the *T. Cinclus* as referable to the *Alpina* (his *Variabilis*) in some state. It must not be overlooked, however, that before Montagu had published his discovery, the close practical observation of Wilson the ornithologist of America, had put him in possession of the fact also.

These birds must certainly migrate from the arctic regions in the winter; since neither Brünnich, Müller, Fabricius, nor the *Fauna Suecica* make any mention of the *Tringa Cinclus*.

10. CHARADRIUS HIATICULA. *Ringed Plover.*

C. Hiaticula. *Gmel.* i. 683. *Lath. Ind. Orn.* ii. 743. *Müll. no.* 209. *Brün. no.* 184. *Fabr.* 112. *Faun. Suec.* 66.—Ringed Plover. *Lath. Syn.* v. 201. *Arct. Zool.* ii. 485. *Br. Zool.* ii. 105. *Mont. Dict. & Supp. Wil. Am. Orn.* 765.

Killed at Hare Island in June: perfectly agreeing with Montagu's description of British specimens; from whence it may be inferred that the remark made by Pennant of the black collar becoming

coming fainter in North America, from the effect of climate, is not correct. Montagu mentions that he has seen several of these birds which had been killed in England, in which the collar was extinct.

11. PHALAROPUS HYPERBOREUS. *Red Phalarope.*

P. Hyperboreus. *Temm.* 457. *Lath. Ind. Orn.* ii. 775.—Tringa Hyperborea. *Gmel.* i. 675. *Müll. no.* 196.—Tringa Lobata. *Fabr.* 109. *Faun. Suec.* 64.—Red Phalarope. *Lath. Syn.* v. 270 & 271. *Br. Zool.* ii. 125. *Arct. Zool.* ii. 494. *Mont. Dict. Supp. & App. Wil. Am. Orn.* ix. 75.

IMMATURE. Phalaropus Fuscus. *Lath. Ind. Orn.* ii. 776.—Tringa Fusca. *Gmel.* i. 675.—Tringa Lobata. *Brün. no.* 171.—Brown Phalarope. *Lath. Syn.* v. 274. *Arct. Zool.* ii. 495.

A small flock of these birds were met with on the west coast of Greenland, in latitude 71°, in June. A considerable variation takes place in the ferruginous colouring of the sides of the neck, in some instances the colour meets at the breast, and in others it does not; it has been considered that this difference is characteristic of the sex, but I am inclined to think that such opinion is erroneous. Some authors have supposed the *Tringa Fulicaria* of Linneus's *Systema Naturæ* and of Brünnich to be the female of this species, and have consequently described it as differing extremely: but I have had no hesitation in placing the *Tringa Fulicaria* as a synonym of the true *Tringa Lobata* (not the *T. Lobata* of Fabricius, which is the present bird). The *Phalaropus Fuscus* with its synonyms is considered as the immature bird, on the authority of Temminck and the *Fauna Suecica*; but great confusion has been made in the synonyms referred to by other writers. I am not acquainted with the winter plumage of this species; but think it probable that the ferruginous tints are peculiar to the summer months, as the specimens killed in June were very irregularly and uncertainly marked.

12. PHA-

12. PHALAROPUS PLATYRYNCHOS. *Flat-billed Phalarope.*

Phalaropus Platyrynchos. *Temm.* 459.

SUMMER. Tringa Fulicaria. *Linn. Syst. Nat. ed.* xii. *vol.* i. 249. *Brün. no.* 172. *Fabr.* 111. *Müll. no.* 196.—Tringa Hyperborea, *var.* β. *Gmel.* i. 676.—Red Phalarope female. *Lath. Syn.* v. 271.

WINTER. Phalaropus Lobatus. *Lath. Ind. Orn.* ii. 776.—Tringa Lobata. *Gmel.* i. 674. *Müll. no.* 195.—Grey Phalarope. *Br. Zool.* ii. 123. *Lath. Syn.* v. 272. *Arct. Zool.* ii. 494. *Mont. Dict.*—Grey Phalarope. *Wil. Am. Orn.* ix. 72.

IN CHANGE. Phalaropus Glacialis. *Lath. Ind. Orn.* ii. 776.—Tringa Glacialis. *Gmel.* i. 675.—Plain Phalarope. *Lath. Syn.* v. 273. *Arct. Zool.* ii. 495.—Grey Phalarope. *Mont. App.*

YOUNG. Tringa Lobata, var. β. *Gmel.* i. 674.

However unwilling I feel to admit alterations in names, I am induced to do so in the present instance, and to adopt Temminck's specific appellation, both as appropriate, and distinct from the confusion in which the various other synonyms which are referred to are involved. The specimen from which the account is taken was killed on the 10th of June, out of a flock of four, on the west coast of Greenland, in latitude 68°. They were swimming in the sea, amongst icebergs three or four miles from the shore. From the considerable difference between the summer and winter plumage of this bird, it is not surprising that so many mistakes have been made. My specimen, which was a male, agrees with Temminck's description of the full-plumaged bird in summer, except that the whole under parts have a considerable quantity of white mixed with the brick red, the white being rather predominant. Before I had an opportunity of consulting the *Manuel d'Ornithologie*, which confirmed my opinion, I had arrived at the conclusion that the *Tringa Fulicaria* of Brünnich was this bird: his accurate description of the bill left no doubt in my mind, notwithstanding the difference in the plumage, the consequence of season. Fabricius enumerates the *Tringa Fulicaria* in

in his *Fauna Groelandica;* but the bird itself does not appear to have fallen under his notice: he was aware, however, that it could not be referred to his *Tringa Lobata*. This species is only known to British naturalists in its winter state.

13. ALCA ALLE. *Little Auk.*

A. Alle. *Gmel.* i. 554. *Lath. Ind. Orn.* ii. 795. *Brün. no.* 106. *Fabr.* 84. *Faun. Suec.* 50. *Mull. no.* 142.—Little Auk. *Lath. Syn.* v. 327. *Arct. Zool.* ii. 512. *Mont. Dict. & Supp. Br. Zool.* ii. 158. *Wil. Am. Orn.* ix. 94.—Uria Alle. *Temm.* 611.

This species was abundant in Baffin's Bay and Davis's Straits; and in latitude 76° was so numerous in the channels of water separating fields of ice, that many hundreds were killed daily, and the ship's company supplied with them. The whole of the birds in the breeding season (the sexes being alike) had the under part of the neck an uniform sooty black, terminating abruptly and in an even line against the white of the belly; the young birds, which we saw in all stages from the egg, as soon as they were feathered were marked exactly as the mature birds: but in the third week of September, when we were on our passage down the American coast, every specimen, whether old or young, was observed to be in change; and in the course of a few days the entire feathers of the throat and cheeks and of the under part of the neck had become white; this latter state has been erroneously considered by some authors as that of the immature bird. It has been correctly described however by Fabricius as the winter plumage. Montagu arrived at the same conclusion in his *Supplement*. We saw neither of the varieties which Fabricius remarks that he had heard of; namely, a red-breasted variety, and one wholly white.

14. URIA BRÜNNICHII. *Brünnich's Guillemot.*

Uria Troille. *Brün. no.* 109.

Until the last autumn this bird was known to naturalists on the authority alone of Brünnich; who, in his *Ornithologia Borealis* having described the species at present denominated the *Uria Troile*, under the specific name of *Lomvia*, proceeds to notice the existence of a second species much resembling it, and which he names the *Uria Troile*: this second species is the present bird. Linneus originally called the first bird *Alca Lomvia* in his *Systema Naturæ*, edit. 10. (1758) vol. i. 130; but in the second edition of his *Fauna Suecica* (1761), he named it *Troile*. Brünnich in 1764 took up the specific appellation of *Lomvia* from the *Systema Naturæ*, adding the description he found given of it in the *Fauna Suecica* under the name of *Troile*, and applied *Troile* to his new bird, referring, however, to the *Fauna Suecica* probably as authority for the name. From this confusion I apprehend it has arisen that both these birds have not since Brünnich published his work been noticed by general authors as distinct species. Dr. Leach on examining this bird ascertained it to be a distinct species; and not being aware that it had been previously distinguished and described by Brünnich, exhibited it at the Linnean Society as a new species, under the name of *Uria Francsii* in compliment to Mr. Frederick Franks, whom he then supposed to have been the person by whom it had been first killed. I have already had occasion, when speaking of the *Phalaropus Platyrynchos*, to remark the accuracy in observation of Brünnich. It is but justice to attach his name to a species of which his claim to priority of knowledge and of communication is unquestionable. Latham (*Synopsis* vi. 330) notices this bird of Brünnich's, but considers it a variety of the Foolish Guillemot.

The *Uria Brünnichii* was found in abundance in Davis's Straits,

and

and occasionally in Baffin's Bay. A specimen killed on the 10th of June had the feathers of the throat mottled with white; from whence I infer that it undergoes the same changes from season as the *Uria Troile*. A matured specimen was sent by me to my brother, and reached England towards the close of the summer; several were subsequently brought home by the expedition which visited Spitzbergen, as well as by that which went to Baffin's Bay.

It is extraordinary that a species so abundant in the Greenland seas should be unnoticed by Fabricius; it must have escaped his observation altogether, as he has not even mentioned the *Uria Troile*, for which it might on a slight view be mistaken. Length 17 inches—extent 2 feet—weight 2lb. 6oz.; inside of the throat yellow, irides dark; throat and neck sooty brown; head black; hind head, hind neck, back and wings, dark sooty brown; the wings being lightest, and the secondaries tipt white; the feathers of the head and neck have a peculiar smoothness and softness; from the eye to the hind head is a line occasioned by a division of the feathers; belly and all beneath pure white, running up to a point in the neck; the feathers are very thick, and on being removed a dark down appears between them and the skin; legs marbled, brown and yellowish; claws black; no difference in plumage between the sexes. With the exception of the colour of the dark plumage, this description might be applied to the Foolish Guillemot; but the specific distinction is well pointed out by Brünnich in the following words: "Lomviæ in omnibus simillima, excepto rostro latiori et breviori, cujus margines etiam in exsiccatis exuviis flavescunt." The yellow margin extends from the corner of the mouth, along the edge of the upper mandible, to the point to which the feathers project on the bill: it is rather horn-coloured than yellow. Brünnich mentions three other birds,

Nos. 110, 111 and 112, which he calls Svarbag, Ringvia and Alga; the two former Iceland and the latter Danish birds: he is undetermined whether these be distinct species, or the present in different states of plumage: I am inclined to consider the latter supposition as the correct one.

It will be necessary to make some alteration in the specific character of *Uria Troile*, as given in Gmelin and Latham, to distinguish it from *Uria Brünnichii*. It is therefore proposed to describe the two species as follows:

U. Troile. U. corpore fusco, pectore abdomineque niveo, remigibus secundariis apice albis, rostro longitudine capitis: mandibula superiore quadruplo longiore quam lata.

U. Brünnichii. U. corpore fuliginoso, pectore abdomineque niveo, remigibus secundariis apice albis, rostro capite breviore: mandibula superiore triplo longiore quam lata.

15. URIA GRYLLE. *Black Guillemot.*

U. Grylle. *Temm.* 608. *Fabr.* 92.—Black Guillemot. *Br. Zool.* ii. 163. *Mont. Dict. & Supp. Lath. Syn.* vi. 332. *& Supp.* 265.

MATURE WINTER. U. Grylloides. *Brün. no.* 114.—U. Balthica. *Brün. nos.* 115 *&* 116.

MATURE SUMMER. U. Grylle. *Brün. no.* 113. *Lath. Ind. Orn.* ii. 797.—Colymbus Grylle. *Gmel.* 584. *Faun. Suec.* 52.—Colymbus Gryllus. *Müll. no.* 151.—Black Guillemot. *Arct. Zool.* ii. 516.

The states of plumage of this bird are clearly described from the extensive and accurate observation of Fabricius. The young, when just feathered, are spotted black and white beneath, but otherwise resemble the parents. On the approach of winter the whole become varied with black and white; the feathers of the back margined with white; the head, throat and breast, white lightly spotted with black, the wings continuing black, and the

speculum

speculum white. In this state it has been described by Brünnich as the *Uria Balthica*, No. 115. In *mature* winter plumage the whole bird is more or less speckled, and the upper feathers of the wing spot become tipt with black, giving it a mottled appearance. It is then the *Uria Balthica*, No. 116, of Brünnich. A male specimen, killed in November at Shetland, having the wing spot mottled, shows that this circumstance is not peculiar to the females, as has been supposed. In the spring the plumage gradually reassumes the black. A male killed in Davis's Straits early in June, had the whole head and neck mottled with black and white, equally distributed; the plumage beneath and the back being black with a few white feathers dispersed; the lower part of the abdomen gray as in the neck; the speculum still mottled, but with the white predominating. This bird was killed on our first arrival in the Greenland seas; and it is presumed that the change to full summer plumage was proceeding very rapidly, as we did not afterwards see a mottled bird. The legs of the November and June specimens were red, though not so bright as in summer. The breeding plumage is too well known to need description.

We did not see a variety, unless a specimen killed in September having the primaries rusty brown instead of black may be considered such: the varieties which are noticed by Gmelin, and also by Latham in the *Index Ornithologicus* and in the *Synopsis*, and which are supposed to be found in different places, are referable to the changes of plumage which this bird undergoes during the winter.

16. COLYMBUS SEPTENTRIONALIS. *Red-throated Diver.*

C. Septentrionalis. *Fabr.* 95. *Temm.* 602.

MATURE. C. Septentrionalis. *Gmel.* i. 586. *Lath. Ind. Orn.* ii. 801. *Müll. no.* 153.—C. Lumme. *Brün. no.* 132.—Red-throated Diver. *Lath. Syn.* vi. 344. *Arct. Zool.* ii. 520. *Br. Zool.* ii. 169. *Mont. Dict. Supp. & App.*

BIRDS OF THE FIRST YEAR. C. Stellatus. *Gmel.* i. 587. *Lath. Ind. Orn.* ii. 800. *Brün. no.* 130. *Müll. no.* 159.—Speckled Diver. *Lath. Syn.* vi. 341. *Br. Zool.* ii. 168. *Arct. Zool.* ii. 519. *Mont. Dict. & Supp.*

BIRDS OF THE SECOND YEAR. C. Striatus. *Gmel.* i. 586. *Lath. Ind. Orn.* ii. 802.—C. Borealis. *Brün. no.* 131. *Lath. Ind. Orn.* ii. 801.—Striped Diver. *Arct. Zool.* ii. 519. *Lath. Syn.* vi. 345.

Killed June 30, on the west coast of Greenland, in lat. 71°. The rich chesnut marking on the throat is conical in shape, having the apex, which is sharply pointed, at the throat, and the base resting on the white of the breast; the back of the specimen is slightly sprinkled with white spots, showing that it is a bird of the third or fourth year. Following Temminck, the *Colymbus Stellatus* and *Striatus*, with their synonyms, are here introduced as the immature birds of the present species: Fabricius was aware of the change of plumage, and has described the mature bird well; but no author before Temminck appears to have supposed that the Striped and Speckled Divers were referable to this species.

17. STERNA HIRUNDO. *Common Tern.*

S. Hirundo. *Gmel.* i. 606. *Lath. Ind. Orn.* ii. 807. *Fabr.* 105. *Müll. no.* 170. *Faun. Suec.* 55. *Temm.* 481.—S. Paradisæa. *Brün. no.* 152.—Great Tern. *Wil. Am. Orn.* vii. 76.—Common Tern. *Br. Zool.* ii. 196. *Mont. Dict. & Supp.*

IMMATURE. S. Hirundo. *Brün. no.* 151.—Common Tern. *Lath. Syn.* vi. 361. Great Tern. *Arct. Zool.* ii. 524.

Abundant on the coast of Greenland. In the accounts of the authors who have been cited, a difference is observable in the description of the colour of the forehead of this species: by some it is represented as white, and by others as black: the specimens which

which were obtained, and which were very numerous, were all of the latter plumage, which is certainly that of the perfect adult bird. The white feathers on the forehead are found only on young birds of the first year considerably advanced towards maturity. In a still younger state it is supposed to be the *S. obscura* or Brown Tern of Gmelin and Latham, and perhaps also the *S. nigra* of the *Fauna Suecica*, Müller and Brünnich. There is a remarkable difference between the Greenland common Terns and those of the European coasts, in their bills and legs; the bills of the Greenland birds are one-third shorter than the European ones, and the tarsi of the former are only half the length of the latter.

18. LARUS MARINUS. *Great Black-backed Gull.*

L. Marinus. *Fabr.* 102. *Temm.* 490.

MATURE. L. Marinus. *Gmel.* i. 598. *Lath. Ind. Orn.* ii. 813. *Brün. no.* 145. *Faun. Suec.* 55. *Müll. no.* 163.—Black-backed Gull. *Lath. Syn.* vi. 371. *Br. Zool.* ii. 172. *Arct. Zool.* ii. 527.—Great Black-backed Gull. *Mont. Dict. & App.*

IMMATURE. L. Nævius. *Gmel.* i. 598.—Wagel. *Lath. Syn.* vi. 375. *Br. Zool.* ii. 182. *Arct. Zool.* ii. 528.

The largest of the known Gulls. This bird was once, and once only, seen from the ships, when they were high up in Baffin's Bay, but at a distance too great to obtain a specimen. It was known to Fabricius both in its mature and immature plumage; but he was probably mistaken in considering the *L. varius* of Brünnich as a synonym of the young bird: that from its size is probably an immature Herring Gull. The *L. marinus* is too well known to need a particular description.

19. LARUS GLAUCUS. *Glaucous Gull.*

L. Glaucus. *Gmel.* i. 600. *Fabr.* 100. *Brün. no.* 148. *Müll. no.* 169. *Lath. Ind. Orn.* ii. 814.—Glaucous Gull. *Lath. Syn.* vi. 374. *Arct. Zool.* ii. 532. & *Supp.* 70.

Notwithstanding the confusion in which the larger species of Gulls

Gulls are involved, there appears no doubt of the application of all the above references to the species now under description. The *L. glaucus* of Temminck is not quoted, because, as will be hereafter shown, it is a different species.

None but mature birds in the perfect summer state were killed during the voyage, but these were very common throughout Davis's Straits and Baffin's Bay. I am fortunately able to make the history of its plumage complete from specimens in my brother's collection of British birds; and I am happy thus incidentally to record it for the first time as an addition to British ornithology.

In immature plumage it is mottled throughout with an uniform light-brown and white, being distinguished from the young of other well-described species by being without the darker marks on the wings and tail: during the first year the bill has the upper mandible less arched, the angular projection of the lower mandible not so defined, and the extremities of both lead-coloured. In winter the mature bird has the head and neck mottled with brown, as is usual with all the white-headed Gulls. In the perfect summer state, the whole plumage is white excepting the back, scapulars, and wing-coverts, which are a very light ash-colour; the primary quill-feathers are still lighter, the ends and under part being pure white; there is no black whatsoever on any part of the plumage: hence the bird from Hudson's Bay, described in Latham's *Synopsis* at the page referred to above, with six of the primary quill-feathers black at the ends, must have been another species.

When arrived at maturity the bill is three inches in length, of a lightish horn-colour, the angular projection of the lower mandible being bright red; orbits naked, straw-coloured and very fierce; legs and feet a livid flesh-colour. In size it is somewhat inferior to the *L. marinus;* the bill, tarsus, and body of the latter being decidedly greater. Length of a male specimen twenty-nine

inches

inches and a half. Extent sixty-three inches. Weight 4 lb. 8 oz. Length of the tarsus two inches seven-eighths: the females averaged rather less. Temminck (*Manuel*, p. 490, note) appears to have seen an immature specimen of this bird, to which he was disposed to give the name of *L. giganteus*: this name would not be a correct one, because it is a smaller bird than the *L. marinus*. Temminck identifies his specimen with the *L. Ictyætos* of Pallas, but that bird is a black-headed Gull.

The *Larus glaucus* is unquestionably the Burgomaster Gull of the Dutch, and preys on smaller birds as well as on fish. One specimen which was killed disgorged a little Auk when it was struck, and proved on dissection to have a second in its stomach.

I am indebted to Mr. James Ross, a midshipman of the Isabella, (one of the Discovery ships,) for a singular specimen of a Gull which, though differing in several points, I conceive must be placed under this species: it was shot on the 6th of June near the middle of Davis's Straits. Its description is as follows:

Length twenty-six inches; extent fifty-eight inches; a male bird; plumage wholly white, the feathers of the hind head, neck, back and wings being occasionally tinged with a very faint brownish hue; the legs and feet flesh-coloured; length of the tarsus two inches and a half; irides deep brown; the length of the bill from the corner of the mouth two inches and a half, being full half an inch shorter than in the usual specimens of the *Larus glaucus*; the bill is a yellowish horn-colour, the ends of both mandibles being a lead-colour. From the colour of the bill and the faint spots on the feathers, this bird was evidently immature; and it may reasonably be presumed that its full plumage would have been entirely white. In this, and in its smaller size, it differs strongly from the Glaucous Gull; both of these circumstances, I conjecture,

conjecture, may have been caused by sickness or by scanty supply of food.

20. LARUS ARGENTATUS. *Silvery Gull.*

The bird now under consideration does not appear to have been described in any of the books which are referred to in this memoir. It is necessary therefore to explain why the name of *argentatus* or silvery, which has been used before, has been attached to it. A *Larus argentatus* was introduced by Brünnich, who was followed by Gmelin; but the bird to which the name was applied is evidently the *Larus fuscus* or Herring Gull of Latham, in winter plumage: as is also the Silvery Gull of the *Arctic Zoology* and of Latham's *Synopsis*. In this opinion Temminck concurs, as is shown by his quotations in his *Manuel* under the head of *Larus glaucus*. Latham in the *Index Ornithologicus* takes up the *Larus argentatus* of Brünnich, but considers it erroneously as an aged bird of the *Larus marinus* or Great Black-backed Gull. Montagu finding the term *argentatus* at liberty, applied it in his *Dictionary* to his Less Black-backed Gull; but it will be seen by reference to the *Manuel* of Temminck that the Less Black-backed Gull is the *Larus fuscus* of Linneus and Gmelin.

I apprehend that the reason why the bird under consideration has not been hitherto distinctly described is to be found in its general resemblance to the *Larus glaucus*: it will be therefore best distinguished by a comparative description. In the general character of the plumage they are alike, differing from the other large species of this genus in the entire absence of black in the primary quill-feathers; the shade of the ash-colour of the back, scapulars, and coverts, varies in different specimens from almost the lightest perceptible tint to a darker than the darkest *Larus glaucus* that was killed on the voyage; the principal distinction between

between the two species is in the difference of size; the males of this species average twenty-four inches in length, and the females rather less: extent four feet five to four feet six inches: the legs and bill of both are alike, except in size: length of the tarsus two inches and a half; the wings of the *argentatus* are rather longer in proportion than those of the *glaucus*.

These birds were abundant in Davis's Straits and Baffin's Bay, but were only seen in mature summer plumage: from analogy it may be expected that the immature birds will resemble those of the Glaucous Gull.

I should have been disposed to have considered this bird as a new and undescribed species; but in a personal communication with Mr. Temminck, whose extensive skill and judgement in ornithology are only equalled by the liberality and kindness with which he communicates his knowledge, I have learned that he considers the bird of Greenland to be specifically the same with the Herring Gull of the more southern shores of Europe; but that from the effect of climate the black markings of the primary quill-feathers, which have been hitherto considered an essential characteristic of the species, are changed to white in the arctic countries. The mature summer birds of Greenland (in which state only I have seen them) certainly strongly resemble our Herring Gull in all other points. In deference therefore to such high authority, I add the synonyms of the authors I quote belonging to that bird, as it is found in temperate climates.

L. Fuscus. *Lath. Ind. Orn.* ii. 815. *Müll. no.* 164. *Faun. Suec.* 54.—L. Glaucus. *Temm.* 493.—Herring Gull. *Lath. Syn.* vi. 372. *Br. Zool.* ii. 181. *Mont. Dict. & Supp.*

MATURE WINTER. L. Argentatus. *Gmel.* i. 600. *Brün. no.* 149.—Silvery Gull. *Lath. Syn.* vi. 375. *Arct. Zool.* ii. 533.

MATURE SUMMER. L. Fuscus. *Gmel.* i. 599. *Brün. no.* 142.—Herring Gull. *Arct. Zool.* ii. 527.

IMMATURE. L. Varius. *Brün. no.* 150.—Wagel. *Arct. Zool. Supp.* 70.

 Before

Before I had the pleasure of meeting with Mr. Temminck, he had designed to give the specific name of *argentatus* to the European bird; it will therefore remain as I have placed it at the head of this species: the name of *glaucus*, which in his *Manuel* was given to the Herring Gull, will be removed by him to the true Glaucous Gull. It is singular that Pennant, in his *Arctic Zoology*, under the head of Herring Gull, states that bird to be common in Greenland throughout the year; though no other writer, as far as my observation has extended, mentions the circumstance, and we did not observe a single one with black primary quill-feathers during our voyage in the Straits.

21. LARUS EBURNEUS. *Ivory Gull.*

L. Eburneus. *Gmel.* i. 596. *Lath. Ind. Orn.* ii. 816. *Temm.* 498.—Ivory Gull. *Lath. Syn.* vi. 377. *Arct. Zool.* ii. 529. & *Supp.* 70.—L. Candidus. *Fabr.* 103. *Müll.* p. viii.

Abundant in Baffin's Bay. Authors describe the length of this bird as sixteen or seventeen inches; the matured specimens obtained, averaged twenty inches; but an immature one measured an inch less. Weight about twenty ounces. Nothing can exceed the beauty of the delicate snow-white plumage of this species in its maturity: I apprehend that this takes place at the end of the second year; on the 24th of August the young birds were observed in flight, much mottled with brown about the head, and probably also about the wings, though not so visibly. A specimen killed the first week in June, of a bird apparently of the preceding year, has a few light-brown feathers about the bill, extending towards the eyes, a very small transverse band of brown spots across the primary wing coverts, thickest at the point of the wing; the primary quill and the tail feathers slightly tipped with brown. Since my return I have seen a specimen of an immature bird with the ends of the primary quill-feathers and of the tail-

feathers

feathers tipped with brown: the bill of the immature bird has the extremity yellow as in the mature bird. The wings of this species extend an inch and a half beyond the tail: the legs are black, and the skin very rough; they are feathered within a very short distance of the knee: length of the tarsus only one inch and a half; the claws are much hooked: irides dark brown in every specimen: the legs and bill of the mature birds agreed in colour with the descriptions of the authors quoted; the hind claw is sufficiently conspicuous, though Fabricius says not. These birds are attracted in considerable numbers by whale blubber, and are therefore usually found in company with the *Procellaria glacialis*; they are easily killed, being by no means shy.

22. LARUS TRIDACTYLUS. *Kittiwake Gull.*

L. Tridactylus. *Temm.* 502.—Kittiwake. *Mont. Dict. & Supp.*

MATURE SUMMER. L. Tridactylus. *Lath. Ind. Orn.* ii. 817. *Fabr.* 98.—Kittiwake. *Lath. Syn.* vi. 393. *Br. Zool.* ii. 186.—L. Rissa. *Gmel.* i. 594. *Arct. Zool. Supp.* 70. *Brün. no.* 140. *Müll. no.* 160.

MATURE WINTER. Kittiwake. *Arct. Zool.* ii. 529. *& Supp.* 70.

IMMATURE. L. Tridactylus. *Gmel.* i. 595. *Müll. no.* 161. *Faun. Suec.* 55.—L. Tridactylus. β. *Lath. Ind. Orn.* ii. 817.—Tarrock Gull. *Mont. Dict. & Supp. Lath. Syn.* vi. 392. *& Supp.* 268. *Br. Zool.* ii. 187. *Arct. Zool.* ii. 533. *& Supp.* 70.

It is expedient to distinguish the different states of plumage of this bird, in reference to the authors quoted. Temminck is the first writer who appears to have had a full knowledge of the changes it undergoes. The mature summer plumage is wholly white, with the exception of the back and wings; these are of a deep ash-colour: the black markings of the primary quill feathers have been correctly described by Temminck. In the autumn, the white at the back of the head and neck is changed into a light ash-colour, which is rather deepest behind the ear, forming the appearance of a spot: the small feathers under the eye are

also rayed with black. The young birds when full grown have this autumnal appearance with additional differences correctly described in the *Fauna Suecica*; the bill is black instead of yellow; at the back of the neck the feathers are tipt black, forming a narrow crescent-shaped patch; the wing coverts are tipt black, forming a bar across the wings; primary quills black, with more or less of the inner webs in different specimens white: tail tipt for half an inch with black, except the outer feather on each side, the second having only a spot on the inner web. It is worthy of observation that the outer tail feathers are somewhat longer than the inner ones, giving the tail an appearance of being slightly forked; this is more perceptible in the young birds than in the old ones.

The specific name of *tridactylus* (though given by Linneus to the immature bird) appears preferable, as being more appropriate than that of *Rissa*: it is therefore adopted. I am inclined to suppose that this species attains maturity at the age of one year. In June none were seen with spotted plumage; early in October several immature birds were killed, being marked as above described: the specimens noticed by Montagu as killed in the month of March, and supposed by him to be in complete plumage, had evidently not got rid of all the black markings on the wing coverts, which I believe would have taken place, had they lived a few weeks longer.

The *L. tridactylus* of Gmelin and Müller, and the Tarrock Gull of the *Arctic Zoology*, are the young bird after it has lost the black bar upon the wing, and before the colour has disappeared from the neck and from the tips of the tail-feathers. It is apprehended that the *Larus cinerarius* of Fabricius is the *tridactylus* in winter plumage: its rarity in Greenland, as noticed by him, may be accounted for by the probability that most of these Gulls migrate southwards during that season.

23. LARUS SABINI. *Forked-tailed Gull.*

A full description of this bird having been already presented to the Society*, it is unnecessary to repeat the account.

Mr. Temminck informs me that he has seen this bird in the Museum at Vienna, where it was proposed to call it *Larus collaris*, but that it has not been described by the ornithologists of that capital, or by any author whatsoever before the Memoir above referred to was presented to the Society. The specimen, he thinks, was obtained from Professor Giesecké; but the bird is not to be found in a MS. list of Greenland birds in his own hand-writing, with the sight of which I have been favoured by Mr. Bullock, nor is any other Gull there mentioned with which it could possibly have been confounded.

24. LESTRIS PARASITICUS.

Catharacta Parasitica. *Fabr.* 103.

MATURE. Larus Parasiticus. *Gmel.* ii. 601. *Lath. Ind. Orn.* ii. 819. *Faun. Suec.* 55. *Müll. no.* 166. *Temm.* 512.—Arctic Gull. *Br. Zool.* ii. 179. *Arct. Zool.* ii. 530. *Lath. Syn.* vi. 389. *Mont. Dict. & Supp.*—Catharacta Parasitica. *Brün. no.* 127.

IN BROWN PLUMAGE. Catharacta Coprotheres. *Brün. no.* 128.

IMMATURE. Lestris Crepidatus. *Temm.* 515.—Larus Crepidatus. *Gmel.* ii. 602. *Lath. Ind. Orn.* ii. 819.—Black-toed Gull. *Br. Zool.* ii. 178. *Arct. Zool.* ii. 531. *Lath. Syn.* vi. 387. *Supp.* 268. *Mont. Dict. & Supp.*—Larus Cepphus. *Müll. no.* 168. —Catharacta Cepphus. *Brün. no.* 126.

I have followed the example of Temminck in removing this with the other dark-coloured Gulls from *Larus* and giving them the generic appellation of *Lestris*. Much inaccuracy as well as difference of opinion has existed respecting not only the immature, but the mature birds of this species. The immature bird has been described as a distinct species. Montagu was the first author who had a doubt of the correctness of this arrangement, but he erred in considering the young bird as a variety only. It has been

* See page 520 of this volume.

called

called by the different names cited above, during the first year of its existence, when its tail is destitute of the long feathers, and its whole plumage is marked with transverse bars of light-brown and dingy white. The markings do not entirely leave it in the second year, but are perceptible in the under parts of the wings and in the adjoining under parts of the body: at this period the two centre tail feathers have become elongated, the breast and throat have become white, though sometimes spotted a little, and the ends of the feathers of the back and wing coverts are tinged with brown, the crown of the head being dark brown. As the birds advance in age the under parts and back of the neck become white stained more or less with brown, and the sides and back of the neck are tinged with yellow; the crown of the head and the whole upper parts except the neck are an uniform dark brown, and the two tail feathers are much lengthened. In all these changes there are however considerable variations; and even in the description of the immature bird as a separate species, authors have varied according to the age of the specimen before them. Fabricius's observations ascertained that there was no difference between the sexes; and as he saw them at their breeding places he must have been aware of their difference of plumage in their young state. I learn from Mr. Temminck, who has had recent opportunities of investigating the history of this bird, that he is satisfied the males and females of the same age are alike, and that he is convinced of the specific identity of the *Larus crepidatus*. But the great difficulty is where to place the birds which have their whole under parts brown: these have been erroneously considered by many as the females, and Brünnich made them a distinct species;—the elucidation of this point must wait for further investigation. Several birds in that state of plumage, but no young ones, were killed during the voyage in the Straits.

25. PRO-

25. PROCELLARIA GLACIALIS. *Fulmar Petrel.*

P. glacialis. *Gmel.* i. 562. *Lath. Ind. Orn.* ii. 823. *Faun. Suec.* 51. *Temm.* 518. *Brün. no.* 118. *Fabr.* 86. *Müll. no.* 144.—Fulmar Petrel. *Lath. Syn.* vi. 403. *Arct. Zool.* ii. 534. *Br. Zool.* ii. 203.—Fulmar. *Mont. Dict. & Supp.*

These birds are very abundant at all times in Baffin's Bay and Davis's Straits; the greater part in the plumage described by authors generally: but some were occasionally seen in which the whole under parts as well as the head and neck were ash-coloured, instead of white; and the back and wings of a darker shade: these latter birds agree with the plumage which Temminck has assigned to the young birds; if they were such, the species is two years in attaining maturity, because we killed full-plumaged birds of this character in June; the difference cannot be sexual, as males and females in each colour were obtained.

Whilst the ships were detained by the ice in Jacob's Bay in latitude 71°, from the 24th of June to the 3d of July, Fulmars were passing in a continual stream to the northward, in numbers inferior only to the flight of the passenger pigeon in America.

Latham appears to have been in error in his *Synopsis* in referring to Brünnich as an authority for the tail of this species being black: we did not see any birds so marked.

26. ANAS SPECTABILIS. *King Duck.*

Anas Spectabilis. *Gmel.* i. 507. *Lath. Ind. Orn.* ii. 845. *Faun. Suec.* 39. *Müll. no.* 108. *Fabr.* 63.—King Duck. *Arct. Zool.* ii. 554. *Lath. Syn.* vi. 473. *Br. Zool.* ii. 246. *Mont. Dict. & App.*

I am indebted to Mr. Skene, midshipman of the Isabella, for the only male specimen of this most beautiful Duck, which was shot during our voyage. They were very numerous on the coast of Greenland in company with the Eider Ducks; but they were too shy to approach the ships, and opportunities of seeking them on

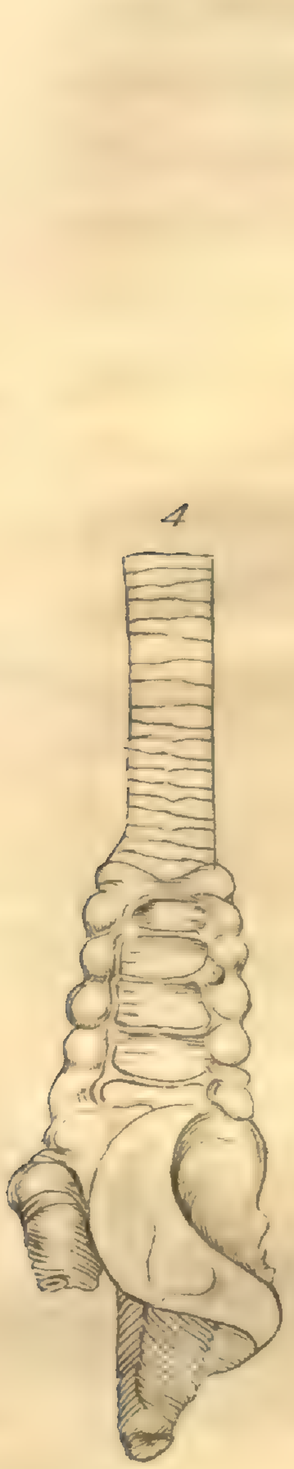
on shore were very rare and very hurried. Two females were killed, agreeing as well as the male with the descriptions of authors. It is reasonable to suppose that they are the same number of years in attaining maturity as the Eider Duck; but the different states of their immature plumage have not as yet been noticed. This is one of the desiderata which it is hoped the next voyage will supply. The rarity of this bird in the milder parts of Europe, and the want of specimens of it in the best collections, have occasioned it to be imperfectly known, except amongst the writers on the ornithology of the northern regions. Temminck in his *Manuel* considers it as the *Anas mollissima* in one of its changes; this is the cause that there is no reference to his work amongst the books cited. It is however noticed in the second edition of his *Manuel*, now preparing for publication, as a distinct species.

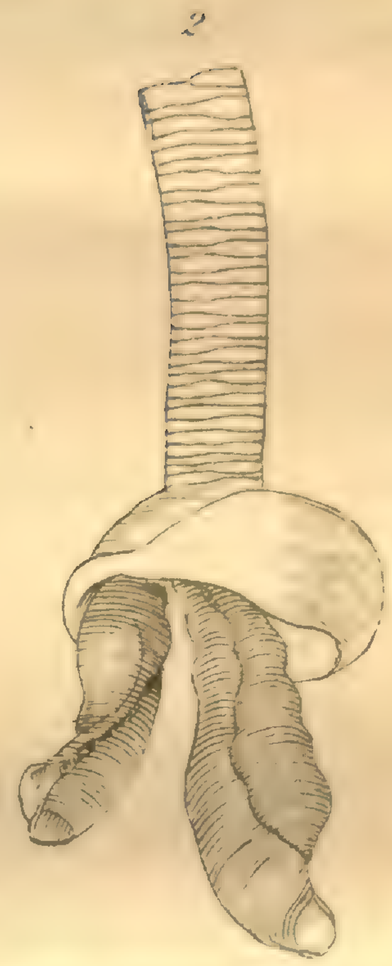
The trachea of the King Duck has so close a resemblance to that of the *Anas mollissima* or Eider Duck, that one description and figure will suffice for both: they are represented in the annexed plate. Tab. XXX. Fig. 1 and 2.

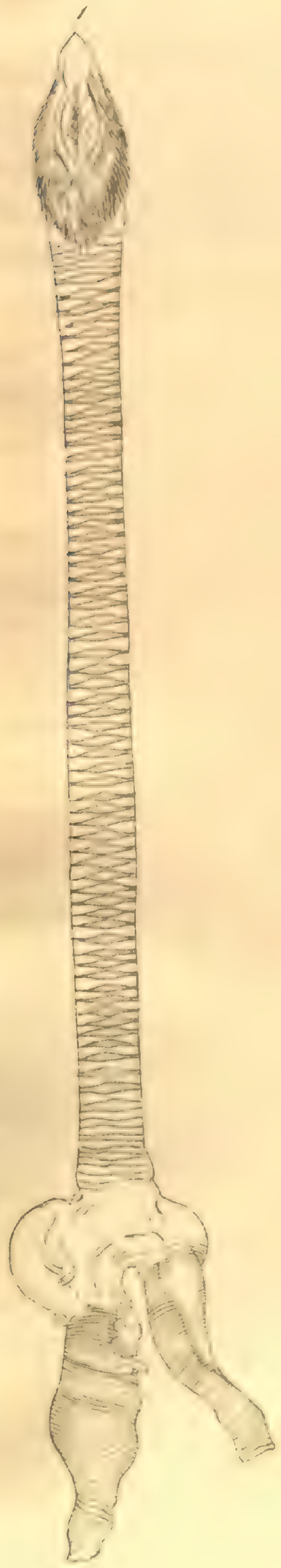
27. ANAS MOLLISSIMA. *Eider Duck.*

A. Mollissima. *Gmel.* i. 514. *Lath. Ind. Orn.* ii. 845. *Temm.* 549. *Müll. no.* 116. *Fabr.* 68. *Brün. nos.* 57, 58, 59, 60, 61, 62, 63, 64, 65, & 66. *Faun. Suec.* 41.—Eider Duck. *Lath. Syn.* vi. 470. *Supp.* 274. *Br. Zool.* ii. 243. *Mont. Dict. & Supp.* *Arct. Zool.* ii. 553. *Wil. Am. Orn.* viii. 122 (male). 125 (female).

Abundant on the coast of Greenland; but we were not fortunate in obtaining many specimens. According to Fabricius these Ducks congregate in immense flocks during the winter. Brünnich has described the male of various ages, as well as the female, and several varieties: according to his account the male is not perfectly mature in plumage till the fourth year; he describes the male at one year old as having white as well as black markings on various







E. Browne, del.

various parts; but a young male which was killed in June exactly resembled the female in colour, though much larger in size. A specimen of a young male, which I obtained in June, had no appearance of change from the brown plumage, and certainly was not a bird of that year; I have therefore formed an opinion on this point different from that of Brünnich. The trachea of the male is uniform in size, rather compressed; the tympanum is small and flatly globose; the branchiæ are of different sizes, the larger one being dilated considerably in the centre.

28. ANAS GLACIALIS. *Long-tailed Duck.*

A. Glacialis. *Gmel.* i. 529. *Lath. Ind. Orn.* ii. 864. *Temm.* 558.—Anas Hyemalis. *Fabr.* 71. *Müll. no.* 123. *Faun. Suec.* 44 & 47. *no.* 133 (female). *Brün. nos.* 75, 76, 77, 78, & 79.—Long-tailed Duck. *Lath. Syn.* vi. 528 (male). & 529 (female). *Br. Zool.* ii. 268. *Arct. Zool.* ii. 566. *Mont. Dict. Supp. & App. Wil. Am. Orn.* viii. 93 (male). & 96 (female).

IMMATURE. Anas Glacialis, var. γ. *Lath. Ind. Orn.* ii. 865 (female).—Anas Hyemalis. *Gmel.* i. 529.—Long-tailed Duck. *Arct. Zool.* ii. 566. & *App.* 76.

As the Long-tailed Duck only winters in Europe, returning to the arctic regions in the summer, the state of its plumage at the time we were in Baffin's Bay is interesting. I obtained a specimen of a mature male on the 30th of June. Its winter dress has been detailed by several of the authors referred to, but I believe a description of its summer plumage will be new. The whole under part of the neck and the breast is black, the appearance of the black spot so conspicuous in winter being removed by the general diffusion of the dark feathers; the sides of the head and a little beyond the eye are a brownish white; round the eye are some white feathers; from the bill a black line runs on the top of the head to the crown, which is black; the back of the neck is chiefly black, but at a small distance below the crown a few white feathers are intermingled with the black ones across

the neck; the black of the back of the neck extends down the back, but in the centre of the upper part of the back near the neck is a patch of black feathers edged with ferruginous; the scapulars are long and narrow, black in the centre and edged with ferruginous-white, the longer ones having more white; the wings are a brownish-black, the quill feathers being the palest; the lower belly and sides to the rump and the under tail-coverts are white, a line of black descending between the white from the back to the tail; of the four middle tail-feathers two are eight inches, the others are about four and a half inches long. Brünnich gives this bird in five different states of sex and plumage, the second (No. 76) is the male in summer plumage. Montagu, in the *Appendix* to his *Supplement*, has described the trachea well; the figures in the annexed engraving, Tab. XXX. fig. 3 and 4, will convey a very correct idea of its appearance: it is most curious and singular in its construction; the window-like formation at the lower part next the tympanum is particularly so.

Subjoined is a complete list of the birds of Greenland, as far as I conceive they are at present ascertained; the *Fauna Groenlandica* has been taken as the foundation thereof, and the alterations which appear to be necessary have been made in it.

The species enumerated by Fabricius are fifty-four: I have reduced five of these, considering them as synonyms of some of the others, but have enlarged the list again by the addition of an equal number of species which had not fallen under the notice of that author; the names of the five reduced species are placed in italics under those to which I have referred them; and the added species are marked with an †; in those cases where I have given the bird of the *Fauna Groenlandica* under a more correct name, the synonym of that work follows in the same line in italics. The birds which are marked * are described in the preceding pages.

1. Falco

1. Falco Albicilla. *Vultur Albicilla.*
* 2. ——— Islandicus. *Falco Islandus.*
——— *rusticolus.*
——— *fuscus.*
†* 3. ——— peregrinus. Not mentioned by Fabricius, or by any other author, as a bird of Greenland.
4. Strix nyctea.
5. —— asio. Fabricius had not seen this bird himself.
* 6. Corvus corax.
* 7. Tetrao lagopus.
* 8. Emberiza nivalis.
9. Fringilla Lapponica.
10. ——— linaria.
* 11. Sylvia Oenanthe. *Motacilla Oenanthe.*
12. Parus bicolor. Not seen by Fabricius.
13. Ardea cinerea. Not seen by Fabricius.
14. Scolopax Lapponica. *Scolopax Jardreka.*
15. ——— gallinago. This and the preceding species are very rare according to Fabricius.
* 16. Tringa maritima. *Tringa striata.*
17. ——— interpres. Not seen by Fabricius.
†* 18. ——— cinerea. Not mentioned by Fabricius or by any other author as a bird of Greenland.
* 19. ——— Alpina.
* 20. Charadrius hiaticula.
21. ——— pluvialis. *Charadrius apricarius.*
* 22. Phalaropus hyperboreus. *Tringa lobata.*
* 23. ——— platyrynchos. *Tringa fulicaria.* Not seen by Fabricius, but described as a Greenland bird by Brünnich.
24. Alca impennis.

25. Alca torda.
—— *pica.*
26. —— Arctica.
* 27. —— alle.
†* 28. Uria Brünnichii. Not described before as a bird of Greenland.
* 29. —— grylle.
30. Colymbus glacialis.
* 31. ——— septentrionalis.
* 32. Sterna hirundo.
* 33. Larus marinus.
* 34. —— glaucus.
†* 35. —— argentatus. Not noticed by Fabricius.
* 36. —— eburneus. *Larus candidus.*
* 37. —— tridactylus.
—— *cinerarius.* Not seen by Fabricius.
†* 38. —— Sabini. A new species.
* 39. Lestris parasiticus. *Catharacta parasitica.*
* 40. Procellaria glacialis.
41. ——— puffinus.
42. Mergus merganser. Not seen by Fabricius.
43. ——— serrator.
44. Anas anser. Not seen by Fabricius.
45. —— bernicla.
* 46. —— spectabilis.
* 47. —— mollissima.
48. —— boschas.
49. —— clangula.
—— *glaucion.*
* 50. —— hyemalis.
51. —— histrionica.

52. Peli-

52. Pelicanus carbo.
53. ——— graculus. *Pelicanus cristatus.*
54. ——— Bassanus. Only seen off the coast; not an inhabitant.

Of the above fifty-four species, I have in the preceding pages described twenty-eight which came immediately under my own observation. Of the twenty-six species which I did not meet with, six were not even seen by Fabricius, and others are unquestionably rare birds in Greenland.

XXXV. *Characters and Description of* Lyellia, *a new Genus of Mosses, with Observations on the Section of the Order to which it belongs; and some Remarks on* Leptostomum *and* Buxbaumia. *By Robert Brown, Esq. F.R.S. Libr. L.S.*

Read April 6, 1819.

In the tenth volume of the Society's Transactions, I have given a description of *Dawsonia*, a genus of Mosses having entirely the habit of *Polytrichum*, but whose peristomium, instead of consisting of a single row of short teeth connected by a horizontal membrane, is composed of an indefinite number of capillary cilia. These cilia, originating both from the inner surface of the capsule, immediately within the orifice, and from the columella itself, form a loose pencil, of which the hairs are sufficiently distinct to allow of a gradual discharge of the seeds.

The correctness of this account of *Dawsonia*, especially as to the origin of the peristomium*, and the nature of the supposed columella†, has been questioned by some of those authors, who have since adopted the genus.

From a careful re-examination, however, I find no reason to alter in any respect the generic character formerly given; and to the description of the species I have only to add, that the upper surface of the leaves is furnished with parallel lamellæ, like those of *Polytrichum*; and that the inner membrane of the capsule is,

* *Bridel Meth. Nov. Muscor.* p. 205.

† *De la Pylaie in Journal de Botanique appliq.* iii. p. 134.

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in the early stage at least, connected by numerous plicæ with those elevations of the surface of the columella, which are noticed in my description, and well expressed in Mr. Bauer's excellent figure.

My principal object, in the present paper, is to establish another genus of the same family, equally related to *Polytrichum* in habit, which resembles *Dawsonia* in the remarkable form of its capsule, but whose peristomium is of so peculiar a structure as to require its separation from both these, and readily to distinguish it from all other genera of Mosses.

This new genus I shall name *Lyellia*, in honour of Mr. Charles Lyell, an accurate English Botanist, who has particularly studied, and made several important discoveries in, the natural order to which it belongs.

Mr. Hooker has already intimated his intention of establishing a *Lyellia* in the same order, to consist of those species of *Leucodon* that have a mitriform calyptra*; but he has readily agreed to transfer the name of our friend from a genus, respecting which there is still some uncertainty, to one so unquestionable as that here proposed; and as I have not a drawing prepared to accompany the present communication, I trust he will give the necessary illustration of this interesting genus, in an early number of his excellent *Musci Exotici*.

LYELLIA.

Stoma edentulum, clausum *epiphragmate* (crasso depresso), cujus *discus circularis* a limbo (latiori) persistenti secedens, cum columellâ remanenti inclusâ cohæret.
Capsula hinc plana inde convexa.
Calyptra cucullata (apice pilosa).

* *Musci Exotici*, vol. i. 17.

Muscus

Muscus (Nepalensis) *habitu* Polytrichi ; *capsulæ figurâ et structurâ interiori* Dawsoniæ *similis* ; *peristomio ab utroque genere diversissimus.*

Lyellia crispa.

Descriptio. *Muscus* cæspitosus.

Caulis erectus, simplicissimus, 3-4-uncialis, ipsa basi tomento radicali cinereo copioso tenuissimo tectus, dein, ad $\frac{1}{5}$ circiter longitudinis, basibus emarcidis foliorum squamatus, supra dense foliatus.

Folia undique versa, e basibus dilatatis subcuneatis semivaginantibus membranaceis pallidis imbricatis, subulata, canaliculata, nigro-viridia, opaca ; marginibus ab apice ad $\frac{2}{3}$ longitudinis et ipso apice carinæ serratis; disco intus longitudinaliter lamellis numerosis, parallelo-approximatis, tenuissimis, e nervo ipsaque superficie ortis ; limbo elamellato minutissime areolato; madore patula leviterque introrsum falcata, siccitate contorta.

Masculi Flores non visi.

Fructificatio Feminea terminalis, solitaria.

Vaginula cylindracea, villis implexis instructa, apice truncato simplici.

Seta sesquiuncialis—biuncialis, erecta, teres, lævis, castanea, demum cava.

Calyptra (nonnullæ delapsæ solum a nobis visæ) cucullata, hinc altè fissa inde truncata, lævis, apice pilis brevibus simplicibus hispidula.

Capsula erectiuscula, circumscriptione ovata, fusca, vix manifeste areolata, hinc plana et ala perangusta cincta, inde convexiuscula, collo brevissimo cylindraceo. *Apophysis* nulla nisi *basis* castaneo-fusca et undique instructa punctis parvis, sparsis numerosis, pustuliformibus, verticaliter ellipticis

lipticis, margine paulo incrassatis, disco angusto, porum referente sed laminam tantum exteriorem perforante.

Operculum (unicum tantum visum quod calyptra delapsa inclusum) e basi depresso-conica desinens in rostrum longitudine circiter ipsius baseos, intus auctum processu cylindraceo, centro baseos inserto, et proculdubio disco circulari terminali columellæ applicito.

Peristomium horizontale, nec obliquum, clausum quasi operculo interiori seu *epiphragmate* crasso, opaco, edentulo, planiusculo, persistente; limbo latiusculo crassiore castaneo; disco pallido leviter depresso; ipso centro circulari plano, crassiusculo fusco, a disco pallido mox separante, arcte cum columella cohærenti, eaque demum abbreviata intra cavitatem retracto.

Membrana interior (s. Theca vera) approximata exteriori, quacum processubus numerosis vasculiformibus connexa, ore coarctato, spongioso-membranaceo, collum breve columellæ arcte amplexante, superficie interiore altè corrugata.

Columella in capsula matura majuscula, subovalis, lacunosa, rugis elevatis applicitis et forsan connexis plicis respondentibus membranæ interioris.

Semina minutissima, in cumulo viridia, separatim hyalina, lævia.

Lyellia crispa was lately discovered in Nepaul (probably in the vicinity of Kathmandu,) by the botanical collectors sent from the Company's garden at Calcutta, by Dr. Nathaniel Wallich, the worthy successor of Dr. Roxburgh in that establishment.

The specimens here described were received from Dr. Wallich by Sir Joseph Banks; and I have also seen others sent at the same time to Mr. Lambert, part of which he very liberally communicated.

The whole number of capsules examined does not exceed twenty-five; but as all of these were ripe and of uniform appearance and structure, they will probably be considered sufficient for the establishment of the genus.

To complete the description of *Lyellia*, male flowers, which, however, probably resemble those of *Polytrichum* and *Dawsonia*, are still wanting; and although there is no reason to doubt that the calyptra and operculum, both of which I have ventured to describe from fallen specimens, really belong to this species, yet it would be more satisfactory to find them while still attached to the capsule; for in this state only, the form of the operculum and its probable central connection with the orbicular disk of the peristomium can be absolutely determined. It will be necessary also to examine a greater number of specimens, and perhaps in different states, to ascertain absolutely the œconomy of this moss in the dispersion of its seeds. It is evident, however, if the description already given be correct, that as far as dispersion takes place, by the mouth of the capsule, it can only be effected by a contraction or shortening of the columella, and a corresponding retraction within the cavity of the capsule, of the central portion of the peristomium which adheres to it; and in this state several of the specimens were actually found.

But it is also manifest, both from the great size of the columella, and its numerous points of connection with the inner membrane, that in this way the whole of the seeds cannot be discharged. It is possible therefore, that in certain circumstances at least, their dispersion may be assisted by the minute pores existing at the base of the capsule. These pores, in the specimens examined, were found to penetrate the outer membrane, or even its external layer only, and being situated below the origin of the seminal bag, their first effect will probably be to accelerate the decay of the internal

spongy

spongy texture of the base of the capsule. But by thus removing support from the columella and inner membrane, they may contribute to the greater shortening of the former, and consequently in increasing the dispersion by the mouth of the capsule; or, from the same cause, the inner membrane being at length ruptured, the seeds may be in part discharged by the pores themselves.

It seems then not improbable, from what we at present know of the structure of *Lyellia*, that for the dispersion of the seeds in this genus there are two distinct contrivances, both of which, however, in the only species yet known, are apparently imperfect. But hence it is perhaps allowable to conjecture, that either other species of *Lyellia*, or a nearly-related genus may exist, in which while the mouth of the capsule remains absolutely shut, the pores of the base may be sufficiently enlarged for the complete performance of this important function.

Pores exactly resembling those of *Lyellia crispa* have not hitherto been found in any other moss. I have observed, however, in several specimens of *Polytrichum alpinum* still more minute pustules, not very different in appearance, and similarly situated on the base of the capsule.

In establishing this new genus of Mosses, it is of importance to determine its more intimate affinities in the family to which it belongs. Its place is unquestionably between *Polytrichum* and *Dawsonia*; and it will I believe be admitted, that these three genera, in the natural method, cannot be separated; though they will necessarily form or be referable to distinct sections of an artificial system founded chiefly on modifications of the peristomium.

In attempting to discover characters by which this group of Polytrichoïdeæ may be distinguished from other Mosses, it is in the first place necessary to determine the whole structure of *Polytrichum*; for this genus, though one of the most common of

the order, and, from the great size of the capsules in many of its species, most readily admitting of accurate observation, has never yet been thoroughly examined.

One of the most striking characters of *Polytrichum* is the dense texture and consequent opacity of the leaves; in which it agrees with the other two genera of the section. This character, however, is not altogether confined to *Polytrichoïdeæ*, and is wanting in *Polytrichum undulatum* and *angustatum*. But the lamellæ of the upper surface of the leaves probably exist, though in very different degrees, in all the species of *Polytrichum*; are equally observable in *Lyellia* and *Dawsonia*; and I am not aware that they have been found in any other genera of the order.

These lamellæ, which are represented in several of the species figured in *English Botany*, by Wahlenberg in *P. lævigatum**, and since noticed by Messrs. Hooker and Taylor† as existing in nearly the whole of the genus, do not belong to the nerve only, as the authors of *Muscologia Britannica* seem to suppose, but in several species cover the greater part of the surface of the upper or spreading portion of the leaf; the sheathing base being either entirely destitute of them, or having them much less developed and strictly confined to the nerve.

In the form and position of the male flowers there is probably an absolute uniformity in the whole of this group: but the only peculiarities consist in the perigonial leaf or bractea being formed chiefly of the sheathing part of the stem-leaf; and in the new shoot proceeding from the centre of the star-like cluster. In *P. undulatum*, however, the former character is by no means obvious, and the latter is not perhaps constant; and both are only presumed to exist in *Lyellia*.

The double calyptra of *Polytrichum*, long considered as the

* *Flora Lappon.* tab. 22. † *Muscol. Brit.* p. 24.

essential

essential character of the genus, equally exists in *Dawsonia*. But this outer or spurious calyptra, formed of densely matted hairs originating from the vaginula and the apex of the inner cucullate calyptra, is wanting in several species of *Polytrichum*, in some of which, and in *Lyellia*, the true calyptra is furnished with a few hairs only, either scattered over the whole of its surface, or confined to its apex; while in others, as in *Polytrichum undulatum*, it is nearly, and in *P. magellanicum* and *lævigatum*, entirely smooth.

Respecting the teeth of the peristomium of *Polytrichum*, I have very little to add, except that in *P. magellanicum* they appear to be eighty in number, which is a higher multiple of sixteen than has hitherto been noticed in this genus, and the greatest number that has yet been found in a single series in the order.

On the nature of the transverse membrane or tympanum of *Polytrichum*, I have formerly made some remarks in treating of *Dawsonia*, and have there considered it as the remains of the pulpy continuation of the columella, originally occupying the cavity of the operculum. But its uniform texture, as well as its exactly circular form and equal margin remain to be accounted for; unless this regularity may be supposed to depend on the circular, and apparently corresponding, aperture of the inner membrane.

Most authors have described the tympanum of *Polytrichum* as minutely perforated. These pores I have never been able to detect; but I observe in many cases an appearance which may perhaps account for the belief in their existence, namely, a minute reticulation on the outer surface of the membrane, apparently owing to the corresponding areolæ of the inner surface of the operculum, with which it was originally in contact.

Polytrichum is remarkable for the various forms of its capsule. Those species, indeed, in which it is quadrangular have been considered

considered as a distinct genus by Mons. de Beauvois. But unless this difference of external form should be found connected with others, either in the habit or in the internal structure, which I believe is not the case, it seems hardly sufficient to justify the subdivision of so natural a genus.

The symmetrical quadrangular capsule, admitting of a regular cylindrical inner membrane, is a character of inferior importance to the plano-convex or dimidiate capsule, which almost necessarily implies, and in *Dawsonia* and *Lyellia* at least is found to be connected with, a corresponding irregularity in the figure of the cavity; and hence I have introduced this remarkable form into the characters of both these genera.

On the structure of the inner membrane of the capsule in *Polytrichum* the only observation that I have met with occurs in *English Botany*, where, in the account of *Polytrichum subrotundum* (plate 1624), it is stated that Mr. James D. Sowerby has discovered, in this species as well as in *Polytrichum undulatum*, a real membranaceous peristomium within the teeth, which, according to Sir James Smith, "gives quite a new idea of the generic character."

This inner peristomium, if it may be so termed, which is well represented in the figure referred to, and consists of a horizontal projection of the inner membrane immediately below its apex, will, I believe, be found to exist in all the species of the genus, and in some cases reduces the aperture of the inner capsule to half the size of the outer at the origin of the teeth. It is always, however, quite entire, and, according to my observations, is formed of a doubling of the inner membrane, with a loose cellular or rather spongy substance interposed between the lamellæ.

Besides this transverse annular projection there are in the inner membrane of all the species of *Polytrichum* that I have examined,

P. undu-

P. undulatum alone excepted, four longitudinal equidistant processes, extending from the aperture to the base of the capsule; and in many species projecting so far into its cavity as to come in contact either with the salient angles or sides of the columella, and consequently to subdivide it into a determinate number of cells.

The analogy of these longitudinal processes with the more numerous and irregular plicæ in *Dawsonia* and *Lyellia* is obvious; and I have not myself met with similar processes of the inner membrane in any other genus of mosses. They do not, however, afford an absolutely distinguishing character of this group, as they seem to be altogether wanting in *Polytrichum undulatum*; and Hedwig, it must be admitted, has represented an apparently analogous structure in *Gymnostomum pyriforme**.

The quadrangular or four-winged columella of *Polytrichum commune* is well figured and described by the accurate Schmidel†; and I have found an equally regular form of this body in most of the species of *Polytrichum* that I have examined; though in many it is less evidently winged than in *P. commune* and the species nearly related to it.

Mons. de Beauvois seems to consider the alæ of the columella as themselves forming complete septa, and also that in this state they exist only in such species as have quadrangular capsules; for to these he limits his genus *Polytrichum*, distinguished by him from *Pogonatum* by its multilocular fruit. The cavity, however, is completely subdivided in several of the species with cylindrical capsules, as in *P. urnigerum*, and in a new species very nearly related to it (*P. microstomum*, nob.) lately received from Dr. Wallich: and the alæ of the columella, as far as

* *Fundam. Hist. Nat. Muscor. Frond.* pars ii. tab. 2. β.

† *Icones pl.* p. 236. tab. 59. fig. 15.

I have

I have observed, never form complete septa, at least in the ripe fruit; though in those species having quadrangular capsules they nearly reach the parietes opposite to the external angles, towards which they are directed.

As the columella of *Polytrichum* retains its regular form in the ripe capsule, its real structure may even then be in a great measure determined. In this stage I find its wings, or compressed sides, to consist of a double membrane with an intermediate spongy substance, in which there is no appearance of granules; and the internal denser substance of the axis is equally free from granular matter. But as there is no indication of lateral rupture, the sides in several species remaining perfectly smooth, nor of any central cavity, this structure affords a powerful argument in refutation of those hypotheses which assume the existence of two kinds of granules in the capsules of mosses; the one produced in the cavity formed by the internal membrane, the other in the substance or supposed cavity of the columella itself; the latter being considered as seeds in one of the hypotheses*, and in the other as pollen†.

This argument, however, is not here advanced to disprove the existence of two kinds of granules in the capsules of mosses, but merely against their production in the distinct cavities assigned to them in the hypotheses referred to.

In the greater number of *Polytricha* as well as in *Lyellia* and *Dawsonia* the seeds are extremely minute; a fact with which the increased surface for their production is probably connected: for in *P. undulatum*, where the seeds are larger than in most other species of the genus, this increased surface does not exist; and in *P. lævigatum*, where they are of still greater size, the plicæ of the inner membrane are probably also wanting.

* Palisot Beauvois, *Æthiog.* p. 5. † Keith, *Physiol. Bot.* ii. p. 346.

Although

Although there is but little resemblance in the structure of the peristomium among the different genera of *Polytrichoïdeæ*, they may still be said essentially to agree in the function of this part: for in all of them the complete separation of the seeds is ensured by the smallness of the apertures for their discharge. It may be remarked, that the necessity for this complete dispersion in Mosses seems to be inversely as the size of the seeds. For in those genera of the order in which the capsule either bursts irregularly or has a naked mouth, the seeds are in general larger than in those with a single, and still more manifestly than in those with a double, peristomium. And in conformity with this also, in *Polytrichum undulatum* and *lævigatum* the tympanum is sooner ruptured or removed than in the other species of the genus.

The result of this comparison of *Polytrichum* with *Lyellia* and *Dawsonia*, although it confirms the propriety of their approximation, does not afford any clearly distinguishing mark for the very natural section of the order which these three genera form. In the mean time, however, it may be circumscribed, though not with absolute precision, by a combination of the more general characters which have been now enumerated.

LEPTOSTOMUM.

In defining this genus, which was first proposed in my former paper on Mosses, I relied chiefly on the undivided annular projection of the inner membrane of the capsule. I was induced to employ this modification of the peristomium as a character, though certainly far from being obvious, in finding it to exist in several mosses of the southern hemisphere, having a similar and peculiar habit; and which, had it been neglected, I must have referred to *Gymnostomum*, with the greater number of whose species they have hardly any thing in common.

Mr. Hooker, however, has since found, as he states, the same structure in several other mosses, generally considered as having a naked peristomium, particularly in *Gymnostomum microstomum*, *Griffithianum*, and *fasciculare*; and as these species have but little resemblance to each other, and still less affinity to *Leptostomum*, he has reduced this genus also to *Gymnostomum*.

If the statement referred to be correct, *Leptostomum*, though it may be a natural genus, must be given up, until other marks shall be found by which it may be distinguished. I have not had specimens sufficiently perfect to enable me to judge of the structure of all the species of Gymnostomum mentioned by Mr. Hooker. In one of them, however, *Gymnostomum microstomum*, the peristomium is certainly very different from that of *Leptostomum*. In this species I find, on removing the operculum, that the mouth of the capsule is not only completely covered by a horizontal membrane, but that this covering is derived from the outer membrane of the capsule, and consequently differs in origin as well as in form from the peristomium which it has been said to resemble. Its central portion, however, being extremely thin is soon ruptured and deciduous, and in this state only it has been seen by the authors of the *Muscologia Britannica*.

Gymnostomum microstomum therefore may itself be considered as a distinct genus, to which the name of *Hymenostomum** may be given; and it is worthy of remark, that in its technical character it approaches most nearly to *Lyellia*, though no two mosses differ more widely in almost every other respect.

* Hymenostomum.

Fl. Fem. terminalis.

Stoma edentulum, clausum ***epiphragmate*** (e membrana exteriore orto), ***disco*** tenuissimo (a columella libero) mox rupto et evanido; ***limbo*** persistenti horizontali indiviso.

Calyptra dimidiata, lævis.

Fl. Mas terminalis, gemmiformis.

From

From the account given of *Gymnostomum Griffithianum* it appears that this species also has in the early stage a membrane completely covering the mouth of the capsule. But this membrane probably differs in origin, at least, from that of *Hymenostomum*, as it seems to do both in form and dehiscence from the peristomium of *Leptostomum*.

Of *Gymnostomum fasciculare* I have examined only imperfect specimens, I cannot therefore speak with confidence of its structure. The annular process, however, mentioned by Mr. Hooker is more likely to be the remains of a complete horizontal covering, and probably originating from the inner membrane, than to resemble the peristomium either of *Hymenostomum* or *Leptostomum*. A membrane of this kind is certainly present in some species of *Gymnostomum*, and perhaps may be found in all those that really belong to that genus. It exists also in *Weissia Templetoni*, which so closely resembles *Gymnostomum fasciculare* as to be with difficulty distinguished from it, unless by the inspection of the peristomium; and, in addition to the erect annular peristomium from which the character of the genus is taken, I have observed a similar membrane in *Leptostomum* itself. It seems even to be not an uncommon process or termination of the inner membrane, though it has been remarked only in some of its more obvious and persistent modifications. Thus the spongy membrane figured and described in the two published species of *Calymperes*, seems to be an analogous structure*, as is also the circular disk terminat-

* The circular spongy membrane covering the mouth of the capsule certainly does not form an essential part of the character of *Calymperes*; for, in the only species that I have examined, it is either entirely wanting, or firmly adheres to the inner surface of the operculum, along with which, also, a considerable portion of the columella separates. Nor has Swartz, who established the genus (in *Spreng. Schrad. und Link Jahrb. der Gewäch.* vol. i. p. 1.) even noticed this membrane in his description.

ing the columella in several species of *Splachnum*; and perhaps even the tympanum of *Polytrichum* may be of similar origin.

But these characters of *Leptostomum* and *Hymenostomum*, though they do not appear to have been yet observed in any other mosses, may still perhaps be considered too minute for generic distinctions: and it must be admitted that were nothing to be obtained but the subdivision of an extensive natural genus it could not be necessary to have recourse to them. The divisions in question, however, are certainly not of that kind.

The weakest part indeed of Hedwig's system is its bringing together all those mosses that have a naked peristomium, and even including the greater part of them in the genus *Gymnostomum*; while many of the species so associated are in real affinity much nearer to several other genera of the order having a simple or even a double peristomium.

Thus *Gymnostomum microstomum*, the *Hymenostomum* of the present paper, has less the habit of the genus in which it is placed than of *Weissia*, to some of whose species, especially *W. affinis* and *trichodes*, it seems to approach even in the structure of its peristomium.

Several species of that section of *Gymnostomum*, to which perhaps the genus should be limited, especially *G. fasciculare*, *Bonplandii*, and *Rottleri*, can hardly be distinguished from *Weissia Templetoni**.

* *Weissia Templetoni*, along with a nearly related species found in New Holland, *Funaria minor* of Delile (*Flor. Ægypt.*), and perhaps also *Weissia radians*, may form a genus distinct from *Weissia*, and nearly related to *Funaria*, differing chiefly in the irregular bursting and evanescence of the inner peristomium, which in *Funaria* is regularly divided and generally persistent, though in some cases perhaps equally deciduous. In a variety of *Weissia Templetoni*, or a very nearly related species, collected in 1800 in the county of Donegal, I have observed the outer peristomium to be not unfrequently wanting, even before the separation of the operculum; a fact which, if hereafter confirmed, would establish its affinity to *Gymnostomum fasciculare*.

Gymnostomum

Gymnostomum or *Anictangium pulvinatum* agrees in every other part of its structure with *Grimmia*.

Gymnostomum lapponicum, notwithstanding the difference of calyptra, may be considered as related to *Grimmia Daviesii*, and consequently to *Orthotrichum*, which *G. Daviesii** resembles in its teeth being approximated in pairs.

Gymnostomum viridissimum has exactly the habit and calyptra of *Zygodon*.

Gymnostomum pennatum (*Schistostega* of Mohr,) in one remarkable character may be compared with *Fissidens*†.

Anictangium aquaticum is evidently related to *Cinclidotus* or *Trichostomum*.

Gymnostomum julaceum and *Hedwigia secunda* of Hooker resemble certain species of *Pterygynandrum*, *Neckera* and *Leskia*.

An unpublished moss (*Glyphocarpa capensis*) with a naked peristomium, which I observed on the Table Mountain of the Cape

* *Griffithia Daviesii* nob.

† As Schkuhr (in *Krypt. Gewäch.* ii. p. 31. t. 12.) has ascertained that the operculum of *Gymnostomum pennatum* separates entire, the genus *Schistostega* must be again reduced to *Gymnostomum*, until other distinguishing characters are discovered.

Its resemblance to *Fissidens* consists in the somewhat similar disposition of leaves.

In *Fissidens*, as limited by Bridel, (*Muscol. Nov.* p. 186) the leaves are universally described as presenting their margin instead of their disk to the stem, and as having a doubling of the lower half of their inner or upper margin, extending as far as the nerve.

On this view Bridel (in *l. cit.*) has formed a separate section of the order, consisting of *Fissidens* and *Octodiceras*; and hence also M. de la Pylaie has changed the name of *Fissidens* to *Skitophyllum*. (*Journal de Botan. Appliq.* iv. p. 133.) It seems to me a much simpler explanation of the apparent anomaly to consider the supposed doubling or division of the leaf as its true disk, and the deviation from the usual structure as consequently consisting in the greater compression of the leaf, and in the addition of a dorsal and terminal wing. In support of this view it may be observed, that in the lower leaves of the stem both the additional wings are greatly reduced in size, and in some cases entirely wanting, as they universally are in the perigonial leaves, which have likewise the more ordinary form, being moderately concave and not even navicular.

of

of Good Hope, has the spherical striated capsule as well as the inflorescence and ramification of *Bartramia*: and with this genus also *Anictangium Humboldtii* agrees in its capsule, though its habit is that of *Leskia* or *Hypnum*.

Drepanophyllum of Richard (*Dicranum? falcifolium* of Hooker,) in form and disposition of leaves is related to *Fissidens* and *Neckera*.

Calymperes approaches to *Orthotrichum*, or rather, perhaps, to *Schlotheimia* or *Macromitrium*.

Lyellia, which belongs to the same division of the artificial system, is evidently allied to *Dawsonia* and *Polytrichum*.

And lastly, *Leptostomum*, the genus more particularly under consideration, appears to me most nearly related to *Bryum*; with which indeed its affinity would be completely established, were Hedwig's account of the peristomium of *Bryum macrocarpum* proved to be correct.

To the observations now made on the various affinities of mosses which agree in having a naked peristomium, it may be added, that the genera with a simple peristomium do not form a strictly natural series, several of them being much more nearly related to those in which the peristomium is double than to each other.

But if the correctness of these statements be admitted, it follows that, in many cases to obtain natural genera in this order either additional sources of distinction must be sought for, or those at present in use more minutely investigated.

Of additional characters, which in some cases may be employed with advantage, I shall merely advert to the membranes of the capsule being distinct or contiguous, and to that more intimate union where there seems to be a single membrane only; to the modifications of internal structure of the inner membrane; the differences in form and duration of the columella, or even its being entirely wanting in the ripe capsule; the presence or absence

sence of the annulus; and the insertion, form and relative position of the male flowers, which, though always considered of importance by Hedwig, many of the most distinguished muscologists of the present day entirely exclude from the characters of their genera.

With respect to the principal source of generic distinctions, the Peristomium, in addition to the circumstances generally attended to, namely, the origin, number, direction, form, and actual division of the teeth, it may be of some importance to ascertain their æstivation, which, though very generally, is not always valvular: and especially to mark the existence or want of the *longitudinal striæ* or semi-pellucid lines: for these, if they do not prove the compound nature, at least clearly indicate a tendency to division in the teeth where they are found; division being always in the course of the striæ, and in no instance taking place unless where they are present.

But in considering them, which I am inclined to do, as proving composition or confluence of the teeth, it would appear that there is a much greater uniformity in the structure of the simple or outer peristomium, at least, than is generally admitted; and that the prevailing number of teeth in this series is thirty-two; though by a coalescence, more or less complete, they are frequently reduced to sixteen, in some cases to eight, and in a few even to four.

According to this view, a single longitudinal line in the axis of a tooth indicates the confluence of two teeth; three equidistant lines, one being central, the coalescence of four; and seven lines similarly disposed that of eight.

Nearly the whole of these modifications exist in that natural subdivision of the order, which may be named *Splachneæ*, consisting of *Splachnum*, *Systylium*, *Tayloria*, (*Hookeria* of Schwaegrichen,) *Splachnum squarrosum* of Hooker, and *Weissia splachnoides*.

The

The number of teeth in Splachneæ is thirty-two, which, however, are never entirely distinct and at the same time equidistant, but approximated or united in various degrees in the different genera and species of the section.

Thus in *Tayloria* and *Systylium* the thirty-two teeth are distinct and disposed in sixteen pairs.

In *Splachnum rubrum* and *luteum* there are apparently only eight pairs, each tooth, however, having a pellucid and obscurely-perforated axis. In almost all the other genuine species of *Splachnum* there is the same disposition as in *S. rubrum* and *luteum*; but the pellucid axis of each tooth is less distinct and imperforated.

In *Splachnum angustatum*, and I believe also in a second species nearly related to it, the arrangement is somewhat different; for the sixteen apparent teeth are approximated, and at the base even united in fours, the pellucid axis of each tooth being still less obvious. Hence these species in their peristomium very nearly approach to *Tetraphis*, to which they would be absolutely referable were the union complete.

In *Splachnum squarrosum* the apparent number of teeth is eight, without any actual subdivision. But as each tooth has three equidistant pellucid lines, of which the lateral are nearly as distinct as the central, there can be no doubt that the composition is the same here as in the rest of the section*.

By

* In a late number of *Musci Exotici*, (No. 17. tab. 136.) *Splachnum squarrosum* is transferred to *Octoblepharum*, and, on the authority of M. de Beauvois, is stated to be *Octoblepharum serratum* of Bridel. Mr. Hooker, however, continues to refer it to this genus, on the supposition of its agreeing with the original species in the form of its calyptra: observing that if this should prove not to be the case, it ought to be separated, under the generic name *Orthodon*, formerly given to it by its discoverer M. Bory de St. Vincent.

The calyptra of *O. albidum* is represented as distinctly cucullate, both by Swartz (in *Obs. Bot.* tab. xi. fig. 1.) and M. de Beauvois (in *Flore d'Oware*, i. tab. 31.). I have also

observed

By these lines also *S. squarrosum* is readily distinguished from *Octoblepharum*, in which the apparent number of teeth is the same: for in *Octoblepharum* each tooth has only a single pellucid line; and hence its affinity to certain species at present referable to *Weissia*, with a nearly similar habit and sixteen distinct teeth, whose axis is not perceptibly pellucid.

Weissia splachnoides differs from the other *Splachneæ* in having sixteen equidistant teeth; but as these teeth, according to the indication of the pellucid axis, are double, the arrangement may be compared with that of *Tayloria* and *Systylium*, in which the separation into thirty-two is complete, and the sixteen pairs equidistant. It agrees, however, also in this respect with *Grimmia* and with several species of *Weissia*: but in other important characters, as well as in habit, it is evidently related to *Splachnum*, and offers perhaps one of the best examples of the importance of the male flowers in distinguishing natural genera.

Even *Tetraphis pellucida* may be cited in proof of the same prevailing number in the peristomium; each of its four teeth, when highly magnified, appearing to have seven longitudinal striæ, which, according to this test, would make the real number thirty-two; a structure contributing to fix the place of *Tetraphis* in the natural series between *Splachnum* and *Orthotrichum*.

observed it of the same form in specimens from Madagascar. There seems, therefore, no reason to doubt that these two mosses differ materially even in this part of their structure; and as other differences, of at least equal importance, also exist, both in the peristomium and male flowers, *Octoblepharum serratum*, whose habit is nearly that of *Splachnum*, may be distinguished both from that genus and from *Octoblepharum* by the following characters.

Orthodon.

Fl. Fem. terminalis.

Peristomium simplex, octodentatum, dente singulo striis tribus longitudinalibus instructo (ideoque e quatuor coalitis composito).

Calyptra mitriformis (4-fida, pilosa).

Fl. Mas terminalis, discoideus.

Better evidence on the same subject is afforded by *Trichostomum*, *Didymodon*, and *Leucodon*, in all of which the thirty-two teeth are distinct, though approximated in pairs; by the sixteen bifid teeth of *Dicranum* and *Fissidens*; and by the like number of teeth with a perforated axis in *Trematodon*, *Weissia nuda*, *Didymodon latifolium*, and several species of *Grimmia*.

In all the genera having a double peristomium I believe the pellucid axis more or less manifestly exists; but in these genera there is a great uniformity in the apparent number of teeth in the outer peristomium; there being no instance of actual division in this series beyond sixteen, or of a further approximation, unless in *Orthotrichum*, in several of whose species the approximation or even union of the double teeth by pairs takes place, while in a few others the sixteen teeth are slightly divided at the apex, and in the whole genus the pellucid axis is remarkably distinct.

The only exceptions to the actual division into thirty-two, or the structure indicating that number, in the simple peristomium of mosses, occur on the one hand in certain species of *Weissia*, perhaps in *Encalypta* and in *Octoblepharum*, in all of which, I believe, there is a reduction to sixteen: and on the other in *Polytrichum*, where the number is frequently increased, varying in the different species, and chiefly by multiples of sixteen, from thirty-two to eighty. In this genus also, whatever the number may be, the teeth never have a semipellucid, but rather an opake or thickened axis, and no tendency to union or even approximation is observable. The constant equidistance of the teeth in *Polytrichum* seems to be connected with its peculiar mode of dissemination; for as this takes place through the interstices of the teeth, and as complete separation of the seeds seems necessary on account of their extreme minuteness, a reduction in number and consequent increase of size of these apertures would probably,

bly, in some degree, prevent dispersion, while the unequal distances of the teeth might either produce a deviation from the regular figure, or an early rupture, of the tympanum, which forms an essential part in this economy.

BUXBAUMIA.

In my former paper I have proposed to preserve the genus *Buxbaumia*, as established by Schmidel; and in constructing a character to comprehend both species, I entirely rejected the outer peristomium of Hedwig; and having also adopted his opinion respecting the middle peristomium of *B. aphylla*, which he has termed corona, and considered as analogous to the annulus in many other mosses, it became unnecessary to advert to this part in defining the genus.

Mr. Hooker has since published an excellent analysis of both species, and has followed Ehrhart and Mohr in regarding them as forming distinct genera.

This determination I have now no hesitation in adopting; for, whatever the nature of Hedwig's corona may be, it affords at least an obvious character, and is connected with other differences of sufficient importance to justify the separation; though the two genera must always remain in the same natural section of the order.

The observations that follow belong, therefore, solely to *Buxbaumia aphylla*.

My first remark on this plant relates to its peristomium, on the nature of which, as compared with that of other mosses, at least two different opinions may be formed.

According to one of these, the outer peristomium of Hooker may with Hedwig be considered analogous to the fimbria or annulus existing in many other mosses; and the principal objection

to this view would perhaps be obviated by rejecting the outer peristominm of Hedwig, as I have formerly proposed, and which Mr. Hooker has since done; as there would then be nothing either in the origin or texture of this part essentially at variance with the supposition; the principal remaining difference being its greater length; for the cilia of the peristomium of *Buxbaumia* may be compared with the striæ or divisions existing in the annulus, which seem to be equally determinate in number, and in some cases also disposed in a double series.

On the second supposition, the peristomium of *Buxbaumia* originating entirely from the outer membrane, may, though consisting of several and even of dissimilar series, be regarded as analogous to that portion of the pencil of *Dawsonia* which arises from the same part of the capsule. This analogy is suggested by Mr. Hooker, and is confirmed by a circumstance that he does not seem to have noticed, namely, that his outer peristomium, the corona of Hedwig, consists of a double series of cilia. The number of cilia in each series exceeds sixteen, but hardly amounts to thirty-two; it probably, however, corresponds with that of the plicæ in the membranaceous peristomium.

We have here then a passage from a number still perhaps definite, though disposed in a triple series, to the indefinite number peculiar to, and so striking in, *Dawsonia*.

My second observation relates to the inner membrane of the capsule, of which I find the mouth to be quite entire and open, though before the separation of the operculum it is closed by the terminating process of the columella. Hence *Buxbaumia* has some resemblance to *Polytrichum*, and a still greater to *Lyellia*, in this part of its structure.

Buxbaumia aphylla is the only moss considered as being entirely destitute of leaves; and though it has been oftener and more fully described

described than any other plant of the order, from the monographs of Linnæus and Schmidel to the excellent illustration recently published by Mr. Hooker, there is no difference of opinion on this point. I have lately ascertained, however, that *Buxbaumia aphylla* is always furnished with perfect leaves, which more nearly resemble, both in texture and division, those of a *Jungermannia* than of any species of moss properly so called; and consequently are widely different from those of *Polytrichoïdeæ*, to which this genus is in several respects related.

The leaves in the barren plant, where I first observed them, are lanceolate and but slightly divided. Those at the base of the female perichætium are even broader than the former, but more deeply cut, both laterally and at top, into several capillary segments; while the leaves which proceed from the surface of the perichætium are still more deeply divided, and their segments so much elongated that the minute foliaceous base has been universally overlooked, and the perichætium consequently described as covered with hairs.

XXXVI. Ex-

XXXVI. Extracts *from the* Minute-Book *of the* Society.

Mar. 18, 1817. Read an Extract of a Letter addressed to the Secretary from Sir John Jamison, F.L.S., dated at Regentville, New South Wales, September 10, 1816, as follows:

"I cannot avoid relating to you an extraordinary peculiarity which I have lately discovered in the *Ornithorynchus paradoxus*.—The male of this wonderful animal is provided with spurs on the hind feet or legs, like a cock. The spur is situated over a cyst of venomous fluid, and has a tube or cannula up its centre, through which the animal can, like a serpent, force the poison when it inflicts its wound. I wounded one with small shot; and on my overseer's taking it out of the water, it stuck its spurs into the palm and back of his right hand with such force, and retained them in with such strength, that they could not be withdrawn until it was killed. The hand instantly swelled to a prodigious bulk; and the inflammation having rapidly extended to his shoulder, he was in a few minutes threatened with locked-jaw, and exhibited all the symptoms of a person bitten by a venomous snake. The pain from the first was insupportable, and cold sweats and sickness of stomach took place so alarmingly, that I found it necessary, besides the external application of oil and vinegar, to administer large quantities of the volatile alkali with opium, which I really think preserved his life. He was obliged to keep his bed for several days, and did not recover the perfect use of his hand for nine weeks. This unexpected

and

and extraordinary occurrence induced me to examine the spur of the animal; and on pressing it down on the leg the fluid squirted through the tube: but for what purpose Nature has so armed these animals is as yet unknown to me. The female is oviparous, and lives in burrows in the ground, so that it is seldom seen either on shore or in the water. The males are seen in numbers throughout our winter months only, floating and diving in all our large rivers; but they cannot continue long under water. I had one drowned by having been left during the night in a large tub of water. I have found no other substance in their stomachs than small fish and fry. They are very shy, and avoid the shot by diving and afterwards rising at a considerable distance."

Jan. 20, 1818. Mr. Lambert, V.P. communicated to the Society an Extract of a Letter from Don Jose Pavon of Madrid, one of the authors of the *Flora Peruviana*, stating that he and his companions Ruiz and Dombey had found the potatoe (*Solanum tuberosum*) growing wild in the environs of Lima, and fourteen leagues from thence on the coast of Peru, as well as in Chili; and that it is cultivated very abundantly in those countries by the Indians, who call it *Papas*.

Dr. Maton, V. P. communicated a Letter from the Rev. Revett Sheppard, F.L.S., stating that on the first of this month he shot a fine specimen of the common heron (*Ardea major*), and that its feathers were covered with a powder of a light blue colour; but in what manner this powder is secreted, or whether it occurs in the winter season only, he has not been able to ascertain.

Feb. 17. The Secretary stated, that Mr. Robert Gee has communicated to the President a specimen of *Salix cinerea*, (*Flor. Brit.* 1063, *Eng. Bot.* 1897,) with androgynous catkins,

kins, nearly half the flowers in the upper part of the catkin being male, and the rest female. It was found by himself at Duckinfield near Stockport, in Cheshire.

April 7. Read a Letter addressed to the Secretary by the Rev. Patrick Keith, F.L.S., of which the following is a copy:

DEAR SIR, Bethersden, Ashford, Kent, March 30, 1818.

In my Paper on the subject of the Developement of the Seminal Germ, published in the last volume* of the Society's Transactions, I find that I have unhappily exhibited an incorrect and imperfect representation of Mr. T. A. Knight's hypothesis on the same subject. I have said that "the grand defect of Mr. Knight's hypothesis is, that it does not at all account for the ascent of the plumelet;" a statement that proves to be erroneous; since the fact is, that Mr. Knight's hypothesis does account for the ascent of the plumelet as well as for the descent of the radicle, though the circumstance (I am sorry to say) had completely escaped my recollection at the time I wrote my Paper: not that I had merely glanced at Mr. Knight's hypothesis, and then, after a long interval, undertaken a refutation of it from memory; but that the notes which I did take from Mr. Knight's Paper at the time I read and perused it, contained, by some unaccountable oversight, nothing whatever on the subject of the ascent of the plumelet: I am desirous, therefore, that this declaration and admission of error on my part should appear in the next volume of the Society's Transactions, that the reparation which I now offer to Mr. Knight may be commensurate, as much as possible, with the injury he has sustained. I am, &c.

To A. MacLeay, Esq. P. KEITH.

* Page 252.

May 25.

May 25. Mr. James Dickson, F.L.S. presented a specimen of the Misseltoe, found by him on the 20th of this month growing upon an oak-tree about four miles from Maidstone, by the side of the Medway.

The President announced, that an extensive and valuable collection of Quadrupeds, Birds and Reptiles, made by Mr. George Caley in New South Wales, has been purchased by subscription by the following Members of the Society, and lodged in the Society's Museum, viz.

	£.	s.	d.
The Right Hon. Sir Joseph Banks, H.M.	10	0	0
Sir James Edward Smith, President . .	10	0	0
Alexander MacLeay, Esq. Secretary .	10	0	0
Edward Forster, Esq. Treasurer . . .	10	0	0
William Elford Leach, M.D.	10	0	0
William G. Maton, M.D., V.P. . . .	10	0	0
James Francis Stephens, Esq.	5	0	0
The Lord Stanley, V.P.	10	0	0
Thomas Furly Forster, Esq.	5	0	0
William Kent, Esq.	5	0	0
Richard Taylor, Esq.	3	0	0
Archibald Menzies, Esq.	1	1	0
George Milne, Esq.	2	0	0
Henry Grimston, Esq.	1	1	0
Michael Bland, Esq.	5	0	0
Duncan MacArthur, M.D.	1	1	0
The Lord Bishop of Durham, H.M. . .	10	0	0
Daniel Moore, Esq.	10	0	0
Joseph Sabine, Esq.	5	0	0
Rev. William Kirby	5	0	0
Carried forward	£. 128	3	0

	£.	s.	d.
Brought forward	128	3	0
A. B. Lambert, Esq. V.P.	5	0	0
Charles Stokes, Esq.	5	0	0
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Nov. 3. Dr. Leach exhibited a new species of Guillemot, named by him *Uria Francsii**, discovered by Mr. Francs near Ferroe, and afterwards by Lieut. Parry, R. N. on the west coast of Greenland.

* For a description of this Bird, under the name of *Uria Brünnichii*, by Capt. Edward Sabine, see page 538.

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END OF THE TWELFTH VOLUME.

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ERRATA.

Page 294, *line* 17, (and throughout Mr. Bicheno's Paper on Juncus,)
for *Coruncula* read *Caruncula.*
and for *Coruncule* read *Caruncule.*
315, *line* 9, for *Wahlenburg* read *Wahlenberg.*
357, after line 8, insert *Tab. XV**
399, *line* 10, for *brevibus* read *lævibus.*
415, *line* 16, for *subcinerea* read *subcinereus.*
and for *obscura* read *obscurus.*
429, *line* 1, dele *Pl. XXII. fig.* 8.
—— after line 20, insert *Pl. XXII. fig.* 8.
537, *line* 1, for *Groelandica* read *Groenlandica.*

ERRATA IN THE PLATES.

Tab. 9, for *Perisperm* read *Caruncule.*
21, *fig.* 8, letter *h* wanting, to point out terms.
23, *fig.* 13, letters *a, b* wanting, to indicate front and antenna.